PENNSYLVANIA
WILDLIFE ACTION PLAN

2025–2035

Species of Greatest Conservation Need Species Accounts

Appendix 1.4 – Aquatic and Terrestrial Invertebrates

- Crustaceans
- Freshwater Invertebrates
- Tiger Beetles, Fireflies, and Other Beetles
- Other Flies
- Mayflies, Stoneflies, and Caddisflies
- Ants; Bumble Bees; Sawflies, Horntails, and Allies; Solitary Bees
- Butterflies and Skippers; Moths
- Other Insects
- Molluscs
- Terrestrial Invertebrate
- Citation Format

Crustaceans

Franz's Cave Isopod (Caecidotea franzi)
An Isopod (Caecidotea kenki)
Price's Cave Isopod (Conasellus pricei)
Pennsylvania Cave Amphipod (Crangonyx dearolfi)
A freshwater amphipod (Gammarus cohabitus)
Allegheny Cave Amphipod (Stygobromus allegheniensis)
Biggers' Cave Amphipod (Stygobromus biggersi)
Franz's Cave Amphipod (Stygobromus franzi)
Shenandoah Valley Cave Amphipod (Stygobromus gracilipes)
Pizzini's Cave Amphipod (Stygobromus pizzinii)
Stellmack's Cave Amphipod (Stygobromus stellmacki)
Potomac Groundwater Amphipod (Stygobromus tenuis potomacus)
Spinycheek Crayfish (Faxonius limosus)
Digger Crayfish (Creaserinus fodiens)
Acuminate Crayfish (Cambarus sp. C)
Little Brown Mudbug (Lacunicambarus thomai)
Big Water Crayfish (Cambarus robustus)
Upland Burrowing Crayfish (Cambarus dubius)

Blue Crayfish (Cambarus monongalensis)
Devil Crawfish (Lacunicambarus diogenes)
Northern Clearwater Crayfish (Faxonius propinquus)
Calico Crayfish (Faxonius immunis)
Feminine Clam Shrimp (Cyzicus gynecia)
Eastern Fairy Shrimp (Eubranchipus holmanii)
Euroamerican Clam Shrimp (Limnadia lenticularis)

Freshwater Invertebrates

Refton Cave Planarian (Sphalloplana pricei)
A freshwater sponge (Heteromeyenia longistylus)
A freshwater sponge (Heteromeyenia tentasperma)
A freshwater sponge (Anheteromeyenia ryderi)
A freshwater sponge (Trochospongilla leidii)
A freshwater sponge (Ephydatia muelleri)
A freshwater sponge (Heteromeyenia latitenta)
Urn-shaped Freshwater Sponge (Radiospongilla crateriformis)
River Rock Freshwater Sponge (Trochospongilla horrida)
Pennsylvanian Freshwater Sponge (Trochospongilla pennsylvanica)
Silver-seeded Freshwater Sponge (Anheteromeyenia argyrosperma)
Fragile Freshwater Sponge (Eunapius fragilis)
Bailey's Freshwater Sponge (Heteromeyenia baileyi)

Tiger Beetles, Fireflies, and Other Beetles

Spotted Firefly (Lucidota punctata)
Pennsylvania Cave Beetle (Pseudanophthalmus sp. 44)
Encircled Borer (Agrilus subcinctus)
Charlie Brown Flea Beetle (Capraita sexmaculata)
Eastern Ash Bark Beetle (Hylesinus aculeatus)
An ash bark beetle (Hylesinus criddlei)
White-banded Ash Bark Beetle (Hylesinus fasciatus)
An ash seed weevil (Lignyodes bischoffi)
An ash seed weevil (Lignyodes fraxini)
An ash seed weevil (Lignyodes helvolus)
Lesser Chestnut Weevil (Curculio sayi)
Goat's Rue Leafminer (Odontota notata)
A click beetle (Paracardiophorus cardisce)
Frosty Bark Weevil (Hylesinus pruinosus)
Eastern Hercules Beetle (Dynastes tityus)
Eastern Ironclad Beetle (Phellopsis obcordata)
Eight-spotted Flower Longhorn Beetle (Typocerus octonotatus)
Tompkins County Harp Ground Beetle (Platynus indecentis)
Darlington's Harp Ground Beetle (Agonum darlingtoni)

Appalachian Tiger Beetle (Cicindela ancocisconensis)
Big Sand Tiger Beetle (Cicindela formosa)
Hairy-necked Tiger Beetle (Cicindela hirticollis)
Cobblestone Tiger Beetle (Cicindela marginipennis)
Northern Barrens Tiger Beetle (Cicindela patruela)
Festive Tiger Beetle (Cicindela scutellaris)
Splendid Tiger Beetle (Cicindela splendida)
One-spotted Tiger Beetle (Apterodela unipunctata)
Ghost Tiger Beetle (Ellipsoptera lepida)
Cowpath Tiger Beetle (Cicindela purpurea)

Other Flies

Marchand's Crane Fly (Eutonia marchandi)
Ash Bullet Gall Midge (Dasineura pellex)
Swollen Ash Gall Midge (Dasineura tumidosae)
A crane fly (Phalacrocera tipulina)
A crane fly (Pilaria stanwoodae)
A crane fly (Pilaria vermontana)
A pitcher plant fly (Fletcherimyia fletcheri)
A robber fly (Laphria champlainii)
A leafminer fly (Liriomyza baptisiae)
A crane fly (Brachypremna dispellens)
A crane fly (Dactylolabis montana)
A crane fly (Geranomyia diversa)
A crane fly (Limnophila tenuicornis)
A crane fly (Tanyptera dorsalis)
A crane fly (Tipula apicalis)
A crane fly (Tipula dejecta)
A crane fly (Tipula dorsimacula)
A crane fly (Tipula jacobus)
A crane fly (Tipula nobilis)
A crane fly (Tipula noveboracensis)
A crane fly (Tipula subeluta)
A cranefly (Nephrotoma cornifera)
A cranefly (Nephrotoma polymera)

Mayflies, Stoneflies, and Caddisflies

Beloved Rainbow Caddisfly (Agapetus iridis)
A ring-horn microcaddisfly (Leucotrichia pictipes)
A brachycentrid caddisfly (Adicrophleps hitchcocki)
A Scalris Trichopteran (Hydropsyche brunneipennis)
Toothed Microcaddisfly (Hydroptila dentata)
Mitchell's Autumn Mottled Sedge (Neophylax mitchelli)

An Autumn Mottled Sedge (Neophylax stolus)
Wiggins' Autumn Mottled Sedge (Neophylax wigginsi)
Denning's Purse Case-maker Caddisfly (Ochrotrichia denningi)
Grayson's Purse Case-maker Caddisfly (Ochrotrichia graysoni)
Barr's Tube-maker Caddisfly (Polycentropus barri)
A polycentropodid caddisfly (Polycentropus chenoides)
Harp's Tube-maker Caddisfly (Polycentropus harpi)
A caddisfly (Pycnopsyche conspersa)
Pocono Spiny Crawler Mayfly (Eurylophella poconoensis)
A mayfly (Heptagenia culacantha)
Gildersleeve's Stenacron Mayfly (Stenacron gildersleevei)
Rough Flat-headed Mayfly (Nixe horrida)
Rusty Flat-headed Mayfly (Nixe rusticalis)
A stonefly (Acroneuria arenosa)
Spatulate Snowfly (Allocapnia simmonsi)
Dusky Sallfly (Alloperla biserrata)
Duckhead Sallfly (Alloperla concolor)
Scotia Sallfly (Alloperla vostoki)
Appalachian Stone (Hansonoperla appalachia)
Shenandoah Needlefly (Megaleuctra flinti)
Three-spined Forestfly (Nemoura arctica)
Choctaw Stone (Neoperla choctaw)
Bent Forestfly (Ostrocerca prolongata)
Striped Stone (Perlinella drymo)
Powdermill Forestfly (Soyedina merritti)
Shenandoah Sallfly (Sweltsa palearata)
Gaspe Sallfly (Utaperla gaspesiana)
Three-knobbed Snowfly (Allocapnia forbesi)
Illinois Snowfly (Allocapnia illinoensis)
Appalachian Forestfly (Amphinemura appalachia)
Spiny Springfly (Cultus verticalis)
Atlantic Stone (Neoperla occipitalis)
Vermont Sallfly (Rasvena terna)
Southeastern Forestfly (Soyedina kondratieffi)
Woodlands Sallfly (Alloperla petasata)
Smoky Willowfly (Bolotoperla rossi)
Great Lakes Springfly (Cultus decisus)
Lash Springfly (Remenus bilobatus)

Ants; Bumble Bees; Sawflies, Horntails, and Allies; Solitary Bees
Treat's Collared Ant (Aphaenogaster treatae)
Yellow-banded Bumble Bee (Bombus terricola)
Indiscriminate Cuckoo Bumble Bee (Bombus insularis)

Northern Amber Bumble Bee (Bombus borealis)
Lemon Cuckoo Bumble Bee (Bombus citrinus)
American Bumble Bee (Bombus pensylvanicus)
Red-belted Bumble Bee (Bombus rufocinctus)
Black-headed Ash Sawfly (Tethida barda)
American Sand Wasp (Bembix americana)
Five-spotted Spider Wasp (Episyron quinquenotatus)
A chalcidid wasp (Hockeria eriensis)
A sand wasp (Microbembex monodonta)
Bee Wolf (Philanthus politus)
Spiny Ash Sawfly (Eupareophora parca)
A spider wasp (Anoplius apiculatus)
A spider wasp (Anoplius bengstssoni)
A spider wasp (Anoplius cleora)
A spider wasp (Anoplius cylindricus)
A spider wasp (Arachnospila scelestus)
A spider wasp (Anoplius splendens)
A yellow-faced bee (Hylaeus schwarzii)
White-haired Golden Sweat Bee (Lasioglossum leucocomum)
Felt's Mason Bee (Osmia felti)
Florida Little Carpenter Bee (Ceratina floridana)
Alternate Cuckoo Leafcutter Bee (Coelioxys alternata)
Banks' Cuckoo Leafcutter Bee (Coelioxys banksi)
A leafcutter bee (Coelioxys hunteri)
Porter's Cuckoo Leafcutter Bee (Coelioxys porterae)
A cellophane bee (Colletes eulophi)
A long-horned bee (Eucera dubitata)
A long-horned bee (Eucera rosae)
Dusty Cuckoo Nomad Bee (Holcopasites illinoiensis)
White-faced Summer Mason Bee (Hoplitis albifrons)
A sweat bee (Lasioglossum apocyni)
Atwood's Sweat Bee (Lasioglossum atwoodi)
A sweat bee (Lasioglossum cattellae)
Dreisbach's Sweat Bee (Lasioglossum dreisbachi)
Misbehaved Sweat Bee (Lasioglossum inconditum)
Awesome Sweat Bee (Lasioglossum izawsum)
A sweat bee (Lasioglossum katherineae)
Michigan Sweat Bee (Lasioglossum michiganense)
Hoary Sweat Bee (Lasioglossum pruinosum)
Taylor's Sweat Bee (Lasioglossum taylorae)
Timothy's Sweat Bee (Lasioglossum timothyi)
A leafcutter bee (Megachile ingenua)
Petulant Leaf-cutter Bee (Megachile petulans)

Common Long-horned Bee (Melissodes communis)
A callirhoe bee (Melissodes fimbriata)
A callirhoe bee (Melissodes tepaneca)
Summer Miner Bee (Protandrena aestivalis)
Small Miner Bee (Protandrena parvus)
Nimble Cuckoo Sweat Bee (Sphecodes levis)
Kissing Cuckoo Carder Bee (Stelis labiata)
Oblique Long-horned Bee (Svastra obliqua)
White-breasted Cuckoo Nomad Bee (Triepeolus pectoralis)
A cuckoo bee (Triepeolus quadrifasciatus)
Red-lipped Cuckoo Nomad Bee (Triepeolus rhododontus)
Bear-like Digger Bee (Anthophora ursina)
A metallic sweat bee (Lasioglossum wheeleri)
A callirhoe bee (Melissodes boltoniae)
Drury's Long-horned Bee (Melissodes druriella)
Valiant Long-horned Bee (Melissodes illata)
A callirhoe bee (Melissodes nivea)
Vigorous Long-horned Bee (Melissodes subillata)
An andrenid bee (Andrena asteroides)
Pigmented Miner Bee (Andrena chromotricha)
Eight-spotted Miner Bee (Perdita octomaculata)
Bellwort Miner Bee (Andrena uvulariae)
Sunflower Sweat Bee (Dieunomia heteropoda)
Mallow Bee (Melitoma taurea)
Rehn's Miner Bee (Andrena rehni)
Poor Miner Bee (Protandrena pauper)
Long-faced Plasterer Bee (Colletes validus)
Macropis Cuckoo Bee (Epeoloides pilosula)
Fringed Loosestrife Oil-collecting Bee (Macropis ciliata)
Common Loosestrife Oil Bee (Macropis nuda)
Bee's Knees Oil Bee (Macropis patellata)
Icy Miner Bee (Andrena algida)
An andrenid bee (Andrena banksi)
An andrenid bee (Andrena dimorpha)
An andrenid bee (Andrena fenningeri)
Regular Miner Bee (Andrena regularis)
An andrenid bee (Andrena sayi)
Wheeler's Miner Bee (Andrena wheeleri)
An andrenid bee (Andrena wilmattae)
Distant Miner Bee (Andrena distans)
Bearded Miner Bee (Andrena barbilabris)
An andrenid bee (Andrena ilicis)
An andrenid bee (Andrena illini)

Clark's Miner Bee (Andrena clarkella)
Red-bellied Miner Bee (Andrena erythrogaster)
Cold Miner Bee (Andrena frigida)
Macoupin County Miner Bee (Andrena macoupinensis)
Maria Miner Bee (Andrena mariae)
A mining bee (Andrena nida)
Small Willow Miner Bee (Andrena salictaria)
Sigmund's Miner Bee (Andrena sigmundi)
A leafcutter bee (Paranthidium jugatorium)
Yellow-faced Miner Bee (Andrena aliciae)
A cellophane bee (Colletes aestivalis)
Waterleaf Miner Bee (Andrena geranii)
A cemolobus bee (Cemolobus ipomoeae)
Splendid Sweat Bee (Agapostemon splendens)
A cellophane bee (Colletes productus)
A melittid bee (Melitta melittoides)
A mining bee (Protandrena abdominalis)
Evening Primrose Sweat Bee (Lasioglossum oenotherae)
A long-horned bee (Svastra compta)
An andrenid bee (Andrena gardineri)
An andrenid bee (Andrena lamelliterga)
An andrenid bee (Andrena phaceliae)
A leafcutter bee (Hoplitis simplex)
Williston's Plasterer Bee (Colletes willistoni)
A sweat bee (Lasioglossum pectinatum)
Sweatbee-like Miner Bee (Perdita halictoides)
Pickerelweed Long-horned Bee (Melissodes apicata)
An andrenid bee (Andrena rudbeckiae)
Rose Miner Bee (Andrena melanochroa)
Peaceful Miner Bee (Andrena placata)
Goldenrod Plasterer Bee (Colletes solidaginis)
American Plasterer Bee (Colletes americana)
Compact Plasterer Bee (Colletes compactus)
A yellow-masked bee (Hylaeus floridanus)
Sanicle Yellow-faced Bee (Hylaeus saniculae)
A leafcutter bee (Megachile integra)
Smallpox Sculptured Mason Bee (Heriades variolosus)
Carrot Yellow-faced Bee (Hylaeus sparsus)
A miner bee (Andrena daeckei)
Foveolate Sweat Bee (Lasioglossum foveolatum)
A cuckoo nomad bee (Nomada quadrimaculata)
Rightmeyer's Wee Cuckoo Bee (Nomada sp. MR 1)
A mining bee (Andrena duplicata)

Funeral Cuckoo Leafcutter Bee (Coelioxys funeraria)
A leafcutter bee (Coelioxys immaculata)
Collector Cuckoo Nomad Bee (Epeolus lectoides)
Pacific Cuckoo Bee (Melecta pacifica)
A cuckoo nomad bee (Nomada affabilis)
Armed Cuckoo Nomad Bee (Nomada armatella)
Small Cuckoo Nomad Bee (Nomada parva)
Townes's Cuckoo Sweat Bee (Sphecodes townesi)
Constrained Cuckoo Carder Bee (Stelis coarctatus)
A cuckoo bee (Triepeolus nevadensis)
A cuckoo bee (Triepeolus simplex)
Distinct Mason Bee (Osmia distincta)

Butterflies and Skippers; Moths

Common Roadside Skipper (Amblyscirtes vialis)
Falcate Orangetip (Anthocharis midea)
Dusted Skipper (Atrytonopsis hianna)
Silver-bordered Fritillary (Boloria myrina)
Northern Metalmark (Calephelis borealis)
Henry's Elfin (Callophrys henrici)
Frosted Elfin (Callophrys irus)
Hoary Elfin (Callophrys polios)
Arctic Skipper (Carterocephalus mandan)
Appalachian Azure (Celastrina neglectamajor)
Dusky Azure (Celastrina nigra)
Harris' Checkerspot (Chlosyne harrisii)
Pink-edged Sulphur (Colias interior)
Monarch (Danaus plexippus)
Early Hairstreak (Erora laeta)
Columbine Duskywing (Erynnis lucilius)
Mottled Duskywing (Erynnis martialis)
Persius Duskywing (Erynnis persius)
Olympia Marble (Euchloe olympia)
Baltimore Checkerspot (Euphydryas phaeton)
Two-spotted Skipper (Euphyes bimacula)
Black Dash (Euphyes conspicua)
Dion Skipper (Euphyes dion)
Leonard's Skipper (Hesperia leonardus)
Cobweb Skipper (Hesperia metea)
Indian Skipper (Hesperia sassacus)
Eyed Brown (Lethe eurydice)
Bog Copper (Lycaena epixanthe)
Bronze Copper (Lycaena hyllus)

West Virginia White (Pieris virginiensis)
Mulberry Wing (Poanes massasoit)
Broad-winged Skipper (Poanes viator viator)
Long Dash (Polites mystic)
Green Comma (Polygonia faunus)
Appalachian Grizzled Skipper (Pyrgus wyandot)
Acadian Hairstreak (Satyrium acadica)
Edwards' Hairstreak (Satyrium edwardsii)
Oak Hairstreak (Satyrium favonius)
Golden-banded Skipper (Telegonus cellus)
Silvery Blue (Glaucopsyche lygdamus lygdamus)
Regal Fritillary (Argynnis idalia)
Southern Cloudywing (Thorybes bathyllus)
Southern Variable Dart Moth (Xestia elimata)
Broad Sallow Moth (Xylotype capax)
Black-eyed Zale Moth (Zale curema)
Pine Barrens Zale Moth (Zale lunifera)
Oblique Zale Moth (Zale obliqua)
Gray-banded Zale Moth (Zale squamularis)
Gray Spring Zale Moth (Zale submediana)
Pine Barrens Zanclognatha Moth (Zanclognatha martha)
Doll's Merolonche Moth (Acronicta dolli)
Spiny Oakworm Moth (Anisota stigma)
Burgess's Cutworm Moth (Apamea burgessi)
A noctuid moth (Apamea cristata)
Phyllira Tiger Moth (Apantesis phyllira)
Quivering Dart Moth (Aplectoides condita)
New Jersey Tea Inchworm Moth (Apodrepanulatrix liberaria)
Straight Lined Mallow Moth (Bagisara rectifascia)
Boreal Fan Moth (Brachionycha borealis)
Curved Halter Moth (Capis curvata)
Rare Sand Quaker Moth (Caradrina meralis)
Southern Pine Looper Moth (Caripeta aretaria)
Angus' Underwing Moth (Catocala angusi)
Dejected Underwing Moth (Catocala dejecta)
Sweet Underwing Moth (Catocala dulciola)
Pine Woods Underwing Moth (Catocala sp. 1 nr. jair)
Umber Underwing Moth (Catocala umbrosa)
Bird Dropping Moth (Cerma cora)
Waxed Sallow Moth (Chaetaglaea cerata)
Trembling Sallow Moth (Chaetaglaea rhonda)
Pine Barrens Fungus Moth (Chytonix sensilis)
Melsheimer's Sack Bearer Moth (Cicinnus melsheimeri)

Pine Devil Moth (Citheronia sepulcralis)
Grote's Sallow Moth (Copivaleria grotei)
Pure Lichen Moth (Crambidia pura)
The Pink Streak Moth (Dargida rubripennis)
Post-burn Datana Moth (Datana ranaeceps)
Rubifera Dart Moth (Diarsia rubifera)
Grote's Black-tipped Quaker Moth (Dichagyris grotei)
Pointed Sallow Moth (Epiglaea apiata)
Broad-lined Erastria Moth (Erastria coloraria)
Marsh Fern Moth (Fagitana littera)
Blueberry Gray Moth (Glena cognataria)
Rare Spring Moth (Heliomata infulata)
Slender Clearwing Moth (Hemaris gracilis)
Eastern Buckmoth (Hemileuca maia)
Sundew Cutworm Moth (Hemipachnobia monochromatea)
Figwort Borer Moth (Hydraecia stramentosa)
Straw Wave Moth (Idaea eremiata)
Violaceous Wave Moth (Idaea violacearia)
Fingered Lemmeria Moth (Lemmeria digitalis)
American Brindle Moth (Lithomoia germana)
Franclemont's Lithophane Moth (Lithophane franclemonti)
Thaxter's Pinion Moth (Lithophane thaxteri)
Twilight Moth (Lycia rachelae)
Barrens Itame Moth (Macaria exonerata)
Promiscuous Angle Moth (Macaria promiscuata)
Twin-dotted Macrochilo Moth (Macrochilo hypocritalis)
Ash Sphinx Moth (Manduca jasminearum)
Barrens Metarranthis Moth (Metarranthis apiciaria)
Early Metarranthis Moth (Metarranthis sp. 3)
Tuscarora Emerald Moth (Nemoria tuscarora)
Northern Brocade Moth (Neoligia semicana)
The Angel Moth (Olceclostera angelica)
Splendid Palpita Moth (Palpita magniferalis)
Yellow Stoneroot Borer Moth (Papaipema astuta)
Dark Stoneroot Borer Moth (Papaipema duplicata)
Joe-Pye Weed Borer Moth (Papaipema eupatorii)
Ash Tip Borer Moth (Papaipema furcata)
Veronia Borer Moth (Papaipema limpida)
Loosestrife Borer Moth (Papaipema lysimachiae)
Brick-red Borer Moth (Papaipema marginidens)
Maritime Sunflower Borer Moth (Papaipema maritima)
Sunflower Borer Moth (Papaipema necopina)
Coneflower Borer Moth (Papaipema nelita)

Turtle Head Borer Moth (Papaipema nepheleptena)
Mayapple Borer Moth (Papaipema rutila)
Flypoison Borer Moth (Papaipema amianthii)
Ostrich Fern Borer Moth (Papaipema hesseli)
Masked Parahypenodes Moth (Parahypenodes quadralis)
Buffalo Moth (Parapamea buffaloensis)
Uncommon Oak Moth (Phoberia ingenua)
Purple Plagodis Moth (Plagodis kuetzingi)
Ash Borer Moth (Podosesia syringae)
Barrens Moth (Properigea costa)
Pink Sallow Moth (Psectraglaea carnosa)
Plain Schizura Moth (Coelodasys apicalis)
Maroonwing Moth (Sideridis maryx)
Great Ash Sphinx Moth (Sphinx chersis)
Franck's Sphinx Moth (Sphinx franckii)
Shiny Gray Carpet Moth (Stamnodes gibbicostata)
Gold-spotted Ghost Moth (Sthenopis pretiosus)
Private Sallow Moth (Sutyna privata)
Toothed Apharetra Moth (Sympistis dentata)
Epigaea Looper Moth (Syngrapha epigaea)
Small Tolype Moth (Tolype notialis)
Joyful Holomelina Moth (Virbia laeta)
The Yankee Dart Moth (Abagrotis brunneipennis)
Waved Sphinx Moth (Ceratomia undulosa)
Low Down Ash Bark-miner Moth (Marmara basidendroca)
Ash Bark-miner Moth (Marmara fraxinicola)
Banded Ash Clearwing Moth (Podosesia aureocincta)
Laurel Sphinx Moth (Sphinx kalmiae)
Small Brocade Moth (Oligia minuscula)
A geometrid moth (Orthofidonia exornata)
Columbine Borer Moth (Papaipema leucostigma)
Pearly Indigo Borer (Sitochroa dasconalis)
Eastern Phacelia Flower Moth (Tinagma gaedikei)
Genista Broom Moth (Uresiphita reversalis)
Oval Abrostola Moth (Abrostola ovalis)
Olive and Black Carpet Moth (Acasis viridata)
A tortricid moth (Acleris oxycoccana)
Blueberry Budworm Moth (Abagrotis anchocelioides)
Corylus Dagger Moth (Acronicta falcula)
Pointed Dagger Moth (Acronicta lanceolaria)
Hopeful Dagger Moth (Acronicta sperata)
A noctuid moth (Agnorisma bugrai)
Roseate Grass Moth (Amolita roseola)

Dappled Dart Moth (Anaplectoides pressus)
Puta Sallow Moth (Anathix puta)
White-edged Ancylis Moth (Ancylis albacostana)
A tortricid moth (Ceanothis feeder) (Ancylis semiovana)
A dart moth (Anicla forbesi)
A noctuid moth (Apamea alia)
Poplar Carpenterworm Moth (Acossus centerensis)
Ignorant Apamea Moth (Apamea indocilis)
A noctuid moth (Apamea inordinata)
A noctuid moth (Apamea relicina)
A noctuid moth (Apamea wikeri)
A noctuid moth (Apamea cariosa)
Great Tiger Moth (Arctia caja)
A crambid snout moth (Argyria nummulalis)
Four-lined Cream Moth (Cabera quadrifasciaria)
Fish's Dart Moth (Cerastis fishii)
Willow Dart Moth (Cerastis salicarum)
Sharp Angle Shades Moth (Conservula anodonta)
Pink Star Moth (Derrima stellata)
A lichen moth (Crambidia xanthocorpa)
Young's Grass-veneer Moth (Crambus youngellus)
Graphic Moth (Drasteria graphica)
Dark Marbled Carpet Moth (Dysstroma citrata)
Small Phoenix Moth (Ecliptopera silaceata)
Streaked Ethmia Moth (Ethmia longimaculella)
Zeller's Glass Miner Moth (Ethmia zelleriella)
Rubbed Dart Moth (Euxoa detersa)
Epauletted Pitcher Plant Moth (Exyra fax)
A noctuid moth (Feltia manifesta)
Comstock's Sallow Moth (Feralia comstocki)
New Jersey Tea Leafroller Moth (Filatima n. sp.)
Pink Prominent Moth (Hyparpax aurora)
Greater Idia Moth (Idia majoralis)
A noctuid moth (Lithophane georgii)
Woolly Gray Moth (Lycia ypsilon)
A noctuid moth (Bellura brehmei)
MacElhose's Ethmia Moth (Ethmia macelhosiella)
A depressariid moth (Agonopterix costimacula)
Ash Leaf Cone Roller Moth (Caloptilia fraxinella)
Fringetree Sallow Moth (Sympistis chionanthi)
Major Datana (Datana major)

Dragonflies and Damselflies

Mottled Darner (Aeshna clepsydra)
Variable Darner (Aeshna interrupta)
Seepage Dancer (Argia bipunctulata)
Blue-ringed Dancer (Argia sedula)
River Jewelwing (Calopteryx aequabilis)
Superb Jewelwing (Calopteryx amata)
Appalachian Jewelwing (Calopteryx angustipennis)
Martha's Pennant (Celithemis martha)
Taiga Bluet (Coenagrion resolutum)
Brown Spiketail (Cordulegaster bilineata)
Petite Emerald (Dorocordulia lepida)
River Bluet (Enallagma anna)
Boreal Bluet (Enallagma boreale)
Tule Bluet (Enallagma carunculatum)
Atlantic Bluet (Enallagma doubledayi)
Big Bluet (Enallagma durum)
New England Bluet (Enallagma laterale)
Slender Baskettail (Epitheca costalis)
Spiny Baskettail (Epitheca spinigera)
Seaside Dragonlet (Erythrodiplax berenice)
Little Blue Dragonlet (Erythrodiplax minuscula)
Splendid Clubtail (Gomphurus lineatifrons)
Septima's Clubtail (Gomphurus septima delawarensis)
Skillet Clubtail (Gomphurus ventricosus)
Smoky Rubyspot (Hetaerina titia)
Spine-crowned Clubtail (Hylogomphus abbreviatus)
Green-faced Clubtail (Hylogomphus viridifrons)
Furtive Forktail (Ischnura prognata)
Rambur's Forktail (Ischnura ramburii)
White Corporal (Ladona exusta)
Emerald Spreadwing (Lestes dryas)
Belted Whiteface (Leucorrhinia proxima)
Golden-winged Skimmer (Libellula auripennis)
Yellow-sided Skimmer (Libellula flavida)
Needham's Skimmer (Libellula needhami)
Allegheny River Cruiser (Macromia alleghaniensis)
Royal River Cruiser (Macromia taeniolata)
Elfin Skimmer (Nannothemis bella)
Cyrano Darner (Nasiaeschna pentacantha)
Southern Sprite (Nehalennia integricollis)
Extra-striped Snaketail (Ophiogomphus anomalus)
Riffle Snaketail (Ophiogomphus carolus)

Pygmy Snaketail (Ophiogomphus howei)
Appalachian Snaketail (Ophiogomphus incurvatus)
Maine Snaketail (Ophiogomphus mainensis)
Beaverpond Clubtail (Phanogomphus borealis)
Rapids Clubtail (Phanogomphus quadricolor)
Common Sanddragon (Progomphus obscurus)
Forcipate Emerald (Somatochlora forcipata)
Incurvate Emerald (Somatochlora incurvata)
Mocha Emerald (Somatochlora linearis)
Brush-tipped Emerald (Somatochlora walshii)
Williamson's Emerald (Somatochlora williamsoni)
Sable Clubtail (Stenogomphurus rogersi)
Riverine Clubtail (Stylurus amnicola)
Elusive Clubtail (Stylurus notatus)
Russet-tipped Clubtail (Stylurus plagiatus)
Zebra Clubtail (Stylurus scudderi)
Blue-faced Meadowhawk (Sympetrum ambiguum)
Saffron-winged Meadowhawk (Sympetrum costiferum)
Gray Petaltail (Tachopteryx thoreyi)
Lyre-tipped Spreadwing (Lestes unguiculatus)
Georgia River Cruiser (Macromia illinoiensis georgina)
Umber Shadowdragon (Neurocordulia obsoleta)

Other Insects

Appalachian Grasshopper (Appalachia hebardi)
Seaside Grasshopper (Trimerotropis maritima)
Sphagnum Ground Cricket (Neonemobius palustris)
Longhorn Band-wing Grasshopper (Psinidia fenestralis)
Fringetree Lace Bug (Leptoypha mutica)
A dirt-colored seed bug (Eremocoris depressus)
New Jersey Tea Lacebug (Gargaphia angulata)
A treehopper (Glossonotus nimbatulus)
Wild Indigo Lace Bug (Leptopharsa heidemanni)

Molluscs

Dwarf Wedgemussel (Prolasmidonta heterodon)
Triangle Floater (Alasmidonta undulata)
Brook Floater (Alasmidonta varicosa)
Threeridge (Amblema plicata)
Alewife Floater (Utterbackiana implicata)
Flat Floater (Utterbackiana suborbiculata)
Cylindrical Papershell (Anodontoides ferussacianus)
Fanshell (Cyprogenia stegaria)

Butterfly (Ellipsaria lineolata)
Elephantear (Elliptio crassidens)
Northern Riffleshell (Epioblasma rangiana)
Snuffbox (Epioblasma triquetra)
Wabash Pigtoe (Fusconaia flava)
Longsolid (Fusconaia subrotunda)
Yellow Lampmussel (Lampsilis cariosa)
Pink Mucket (Lampsilis abrupta)
Pocketbook (Lampsilis ovata)
Eastern Lampmussel (Lampsilis radiata)
White Heelsplitter (Pterosyna complanata)
Creek Heelsplitter (Platynaias compressa)
Green Floater (Platynaias subviridis)
Fragile Papershell (Potamilus fragilis)
Tidewater Mucket (Atlanticoncha ochracea)
Eastern Pondmussel (Sagittunio nasutus)
Eastern Pearlshell (Margaritifera margaritifera)
Threehorn Wartyback (Obliquaria reflexa)
Round Hickorynut (Obovaria subrotunda)
Sheepnose (Plethobasus cyphyus)
Clubshell (Pleurobema clava)
Round Pigtoe (Pleurobema sintoxia)
Ohio Pigtoe (Pleurobema cordatum)
Pink Papershell (Potamilus ohiensis)
Rabbitsfoot (Theliderma cylindrica)
Mapleleaf (Quadrula quadrula)
Rockshell (Theliderma metanevra)
Pimpleback (Pustulosa pustulosa)
Salamander Mussel (Simpsonaias ambigua)
Lilliput (Toxolasma parvum)
Pistolgrip (Quadrula verrucosa)
Fawnsfoot (Truncilla donaciformis)
Deertoe (Truncilla truncata)
Rayed Bean (Paetulunio fabalis)
Rainbow (Cambarunio iris)
Wavyrayed Lampmussel (Lampsilis fasciola)
Atlantic Spike (Elliptio producta)
Lance Aplexa (Aplexa elongata)
Globe Siltsnail (Birgella subglobosus)
Watercress Snail (Fontigens nickliniana)
Blue Ridge Springsnail (Fontigens orolibas)
Flexed Gyro (Gyraulus deflectus)
Woodland Pondsnail (Ladislavella catascopium)

Henscomb Hydrobe (Littoridinops tenuipes)
Swamp Lymnaea (Lymnaea stagnalis)
Boreal Marstonia (Marstonia lustrica)
Vernal Physa (Physa vernalis)
Sprite Elimia (Pleurocera proxima)
Sharp Sprite (Promenetus exacuous)
Ohio Pebblesnail (Somatogyrus integra)
Shale Pebblesnail (Somatogyrus pennsylvanicus)
Threeridge Valvata (Valvata tricarinata)
Disk Gyro (Gyraulus circumstriatus)
Midland Siltsnail (Cincinnatia integra)
Varicose Rocksnail (Lithasia verrucosa)
Thicklip Ramshorn (Planorbula armigera)
Silty Hornsnail (Pleurocera acuta)
Marsh Pondsnail (Stagnicola elodes)
Bell-mouthed Ramshorn (Planorbella campanulata)
Broad-banded Forestsnail (Allogona profunda)
Coastal-plain Tigersnail (Anguispira fergusoni)
Banded Tigersnail (Anguispira kochi)
Spike-lip Crater (Appalachina sayana)
Obese Thorn (Carychium exiguum)
File Thorn (Carychium nannodes)
Domed Disc (Discus patulus)
Lowland Pillsnail (Euchemotrema leai)
Toothed Hive (Euconulus dentatus)
Brown Hive (Euconulus fulvus)
Bark Snaggletooth (Gastrocopta corticaria)
White Snaggletooth (Gastrocopta tappaniana)
Brown Bellytooth (Gastrodonta interna)
Maryland Glyph (Glyphyalinia raderi)
Cherrystone Drop (Hendersonia occulta)
Blue Glass (Nesovitrea binneyana)
Foster Mantleslug (Pallifera fosteri)
Variable Mantleslug (Pallifera varia)
Proud Globelet (Patera pennsylvanica)
Widespread Column (Pupilla muscorum)
White-lip Dagger (Pupoides nitidulus)
Bristled Slitmouth (Stenotrema barbatum)
Maze Pinecone (Strobilops labyrinthicus)
Southern Pinecone (Strobilops texasianus)
Baffled Three-tooth (Triodopsis fraudulenta)
Atlantic Threetooth (Triodopsis juxtidens)
Dished Threetooth (Triodopsis vulgata)

Split-tooth Dome (Ventridens virginicus)
Blade Vertigo (Vertigo milium)
Ovate Vertigo (Vertigo ovata)
Pygmy Vertigo (Vertigo pygmaea)
Honey Vertigo (Vertigo tridentata)
Eastern Glass-snail (Vitrina angelicae)
Striped Whitelip (Webbhelix multilineata)

Terrestrial Invertebrates

Heller Cave Springtail (Typhlogastrura helleri)
A ghost spider (Arachosia cubana)
Shoreline Wolf Spider (Arctosa littoralis)
A sheetweb cave spider (Bathyphantes weyeri)
Turret Spider (Geolycosa turricola)
Wright's Burrowing Wolf Spider (Geolycosa wrighti)
An Orb-weaver Spider (Singa eugeni)
Ash Bead Gall Mite (Aceria fraxini)
Ash Flower Gall Mite (Aceria fraxiniflora)
A jumping spider (Habronattus cognatus)
Common Leaf-beetle Jumping Spider (Sassacus papenhoei)
Robust Trapdoor Spider (Antrodiaetus robustus)
A foldingdoor spider (Antrodiaetus unicolor)
Texas Ornamented Jumping Spider (Habronattus texanus)
Pale Nest Spider (Eidmannella pallida)
Audouin's Trapdoor Spider (Ummidia audouini)

Suggested Species Account Citation Format:

Account author last name, first initial, additional authors as applicable. Species common name (*Scientific name*) *In* Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission. 2026. Pennsylvania Wildlife Action Plan, 2025-2035. C. Haffner, D. Day, and N. Welte, editors. Pennsylvania Game Commission and Pennsylvania Fish and Boat Commission, Harrisburg, Pennsylvania.

PENNSYLVANIA WILDLIFE ACTION PLAN

Franz's Cave Isopod

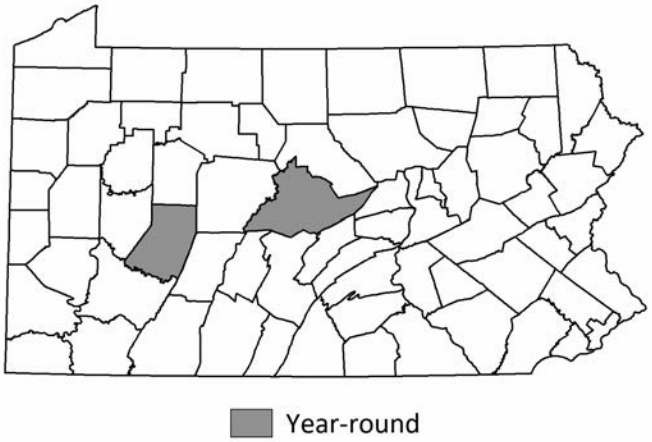
Caecidotea franzi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G2G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: Caves

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Low

Specific Threat: Agriculture occurs within the immediate area with the occurrence. Spruce Creek, adjacent to the cave is classified as Impaired for siltation from agriculture. Poor water quality in the cave/groundwater inputs or groundwater withdrawals could reduce the populations. Actual water pollution in the inhabited cave is unknown.

Action Category: Conserve specific land or seascapes

Specific Action: Protect lands that support rare cave invertebrates with land purchases or easements.

Objective: Make a plan prioritizing sites and parcels for protection. For priority parcels, contact landowners and work toward a protection plan with willing landowners.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of sites protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: Ridge and Valley, Appalachian Plateaus. Physiographic Section: Allegheny Mountain, Appalachian Mountain, Allegheny Front, Appalachian Mountain, Pittsburgh Low Plateau

Other species likely to benefit from this action: Cave crustaceans, cave flatworms, cave spiders, bats

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Low

Specific Threat: Coal mining occurs in the Conemaugh watershed near one inhabited cave. Some streams in the area are impaired for poor water quality related to coal mines. Mining or mine discharges could damage the cave and water quality.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Consider this globally vulnerable species for state listing, so that the environmental review process could protect known sites from new limestone mines.

Objective: Conduct sufficient surveys for this species to determine state legal status.

Action Priority: 3-Medium **Action Urgency:** **Measure:** determination of a definitive state legal status

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: Statewide

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Low

Specific Threat: Coal mining occurs in the Conemaugh watershed near one inhabited cave. Some streams in the area are impaired for poor water quality related to coal mines. Mining or mine discharges could damage the cave and water quality.

Action Category: Manage non-living habitat components

Specific Action: Install AMD treatment systems to restore water quality

Objective: Identify sites supporting this species that are threatened by AMD. Work with local watershed organizations and landowners to develop a plan for each of those sites. Install AMD treatment systems for each of those sites.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of plans written, number of treatment systems installed

Potential Collaborators: Private Landowners

Locations: Physiographic Province: Ridge and Valley, Appalachian Plateaus. Physiographic Section: Allegheny Mountain, Appalachian Mountain, Pittsburgh Low Plateau

Other species likely to benefit from this action: aquatic vertebrates and invertebrates

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An Isopod

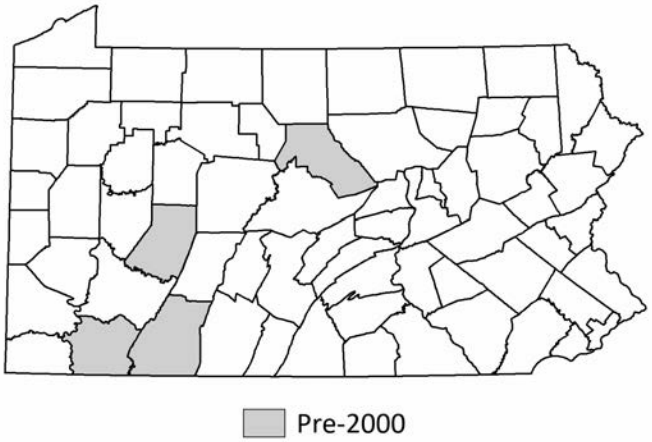
Caecidotea kenki

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Cave streams, and springs/seeps.

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying

Threat Impact: Medium - Low

Specific Threat: Limestone mining could damage the caves occupied by this species.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Consider this globally vulnerable species for state listing, so that the environmental review process could protect known sites from new limestone mines.

Objective: Conduct sufficient surveys for this species to determine state legal status.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: determination of a definitive state legal status

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: Statewide

Other species likely to benefit from this action: Cave invertebrates, bats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Price's Cave Isopod

Conasellus pricei

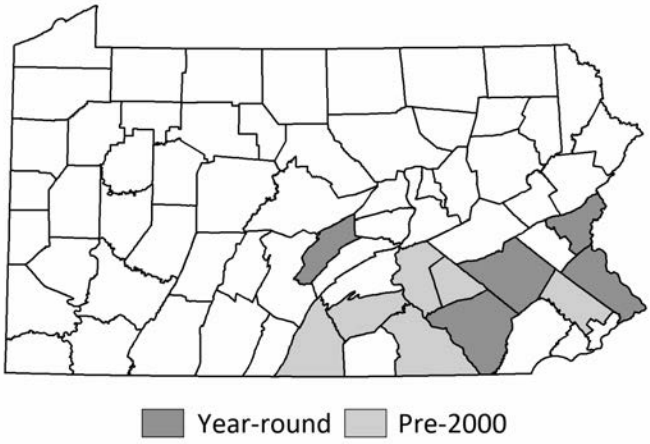
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Eichelberger

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: caves

Primary Habitat: Subterranean

Primary Habitat Type: Other Subterranean

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying

Threat Impact: Medium - Low

Specific Threat: Limestone mining could damage the caves where the species occurs.

Action Category: Conserve specific land or seascapes

Specific Action: Protect lands that support rare cave invertebrates with land purchases or easements.

Objective: Make a plan prioritizing sites and parcels for protection. For priority parcels, contact landowners and work toward a protection plan with willing landowners.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Number of sites protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: Piedmont, New England, Ridge and Valley, Ridge and Valley, Piedmont. Physiographic Section: Appalachian Mountain, Great Valley, Gettysburg-Newark Lowland

Other species likely to benefit from this action: Cave crustaceans, cave flatworms, cave spiders, bats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pennsylvania Cave Amphipod

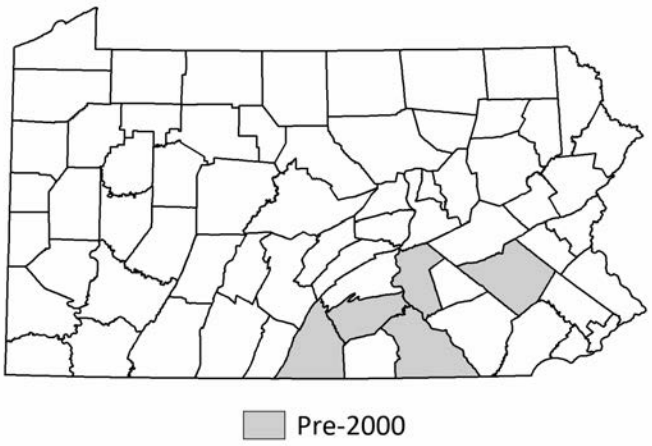
Crangonyx dearolfi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G2

IUCN Red List Designation: Endangered

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Medium - Low

Specific Threat: Runoff from development could pollute water quality in the caves.

Action Category: Conserve specific land or seascapes

Specific Action: Protect lands that support rare cave invertebrates with land purchases or easements.

Objective: Work with willing landowners at priority sites to protect them

Action Priority: **Action Urgency:** **Measure:** number of easements, purchases, or management plans.

Potential Collaborators:

Locations: Physiographic Province: Ridge and Valley, Ridge and Valley, Piedmont, Piedmont, Ridge and Valley, New England, Ridge and Valley, Ridge and Valley. Physiographic Section: Great Valley, South Mountain, Gettysburg-Newark Lowland, Piedmont Lowland, Great Valley, Reading Prong, Great Valley, Blue Mountain

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Runoff from development could pollute water quality in the caves.

Action Category: Conserve specific land or seascapes

Specific Action: Protect lands that support rare cave invertebrates with land purchases or easements.

Objective: Identify priority sites and work with willing landowners to protect them

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of sites protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Section: Piedmont Upland, Piedmont Lowland, Gettysburg-Newark Lowland, Great Valley, South Mountain

Other species likely to benefit from this action: Cave crustaceans, cave flatworms, cave spiders, bats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

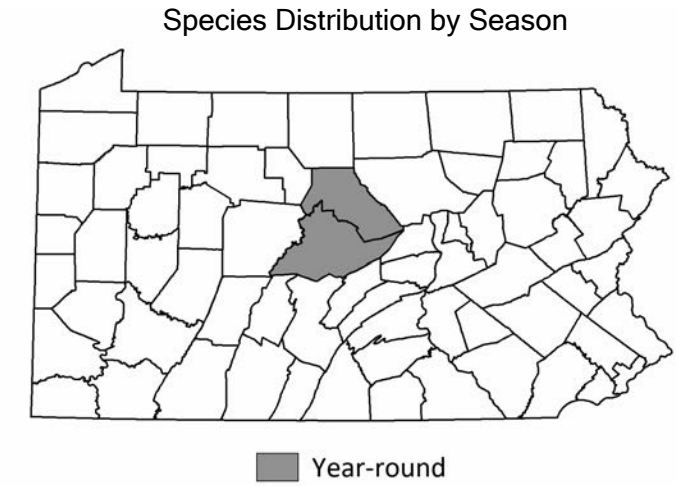
A freshwater amphipod

Gammarus cohabitus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G1G2

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: springs and seeps

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Agriculture occurs within the immediate area with the occurrences. Some streams in the watersheds of the occurrences are classified as "Impaired" by PA DEP for siltation or nutrients related to agriculture. Poor water quality in the cave/groundwater inputs or groundwater withdrawals could reduce the populations. Actual water pollution in the inhabitated caves and springs is unknown.

Action Category: Outreach, communication and distribution

Specific Action: Work with landowners in occupied watersheds to minimize impacts on groundwater quality.

Objective: Make a plan prioritizing sites and parcels for protection. For priority parcels, contact landowners and work toward a protection plan with willing landowners.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** number of engaged landowners

Potential Collaborators: Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC10 Watershed: Pine Cr. (Lower Susquehanna-Penns), Penns Cr., Honey Cr.

Other species likely to benefit from this action: other aquatic invertebrates

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Allegheny Cave Amphipod

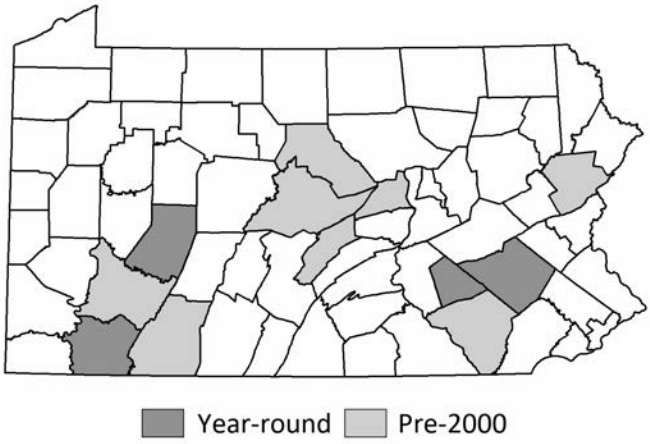
Stygobromus allegheniensis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: caves streams, and seeps/springs

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Medium - Low

Specific Threat: Limestone mining could damage caves where the species lives

Action Category: Conserve specific land or seascapes

Specific Action: Protect lands that support rare cave invertebrates with land purchases or easements.

Objective: Work with willing landowners at priority sites to protect the sites.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of sites protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Section: Allegheny Mountain, Appalachian Mountain, Allegheny Front, Susquehanna Lowland, Great Valley, Gettysburg-Newark Lowland, Piedmont Lowland, Piedmont Upland, Anthracite Upland

Other species likely to benefit from this action: Cave crustaceans, cave flatworms, cave spiders, bats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Biggers' Cave Amphipod

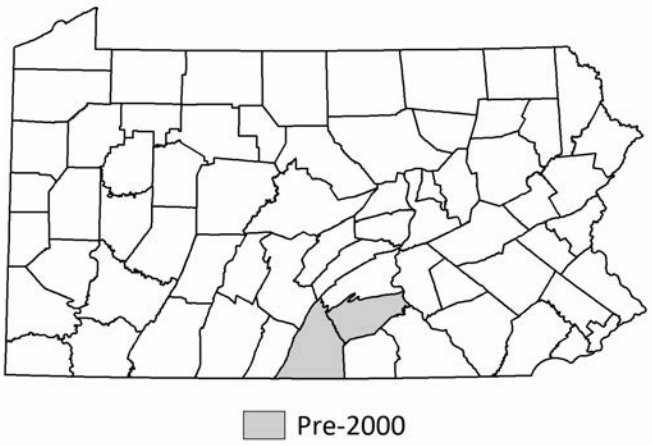
Stygobromus biggersi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G2G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Medium - Low

Specific Threat: Runoff from development could pollute water quality in the caves.

Action Category: Conserve specific land or seascapes

Specific Action: Protect lands that support rare cave invertebrates with land purchases or easements.

Objective: Work with willing landowners to protect sites

Action Priority: **Action Urgency:** **Measure:** number of sites protected

Potential Collaborators:

Locations: Physiographic Province: Ridge and Valley, Ridge and Valley. Physiographic Section: Great Valley, South Mountain

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Runoff from development could pollute water quality in the caves.

Action Category: Conserve specific land or seascapes

Specific Action: Protect lands that support rare cave invertebrates with land purchases or easements.

Objective: Work with willing landowners at priority sites to protect the sites

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of sites protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Section: Great Valley, South Mountain

Other species likely to benefit from this action: Cave crustaceans, cave flatworms, cave spiders, bats

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Medium - Low

Specific Threat: Limestone mining could damage the cave.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Consider this globally vulnerable species for state listing, so that the environmental review process could protect known sites from new limestone mines.

Objective: Do enough surveys to determine a definitive state legal rank

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** a state legal rank is determined.

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: Physiographic Section: South Mountain, Great Valley

Other species likely to benefit from this action:

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Franz's Cave Amphipod

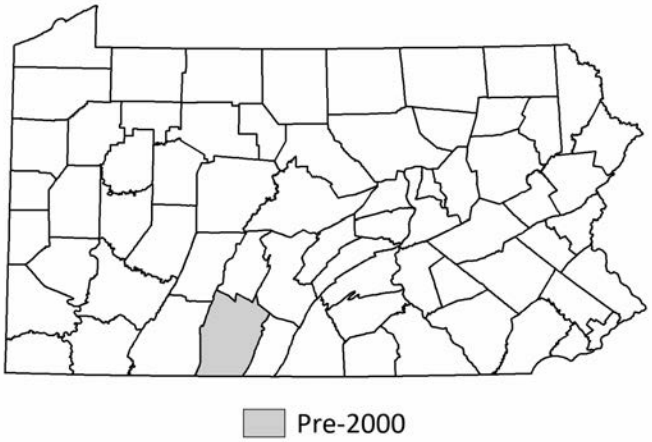
Stygobromus franzi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: caves

Primary Habitat: Subterranean

Primary Habitat Type: Other Subterranean

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Medium

Specific Threat: Agriculture occurs within the immediate area with the occurrence. Spruce Creek, adjacent to the cave is classified as Impaired for siltation from agriculture. Poor water quality in the cave/groundwater inputs or groundwater withdrawals could reduce the populations. Actual water pollution in the inhabited cave is unknown.

Action Category: Conserve specific land or seascapes

Specific Action: Protect lands that support rare cave invertebrates with land purchases or easements.

Objective: Work with willing landowners to protect priority sites

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of sites protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Cave crustaceans, cave flatworms, cave spiders, bats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

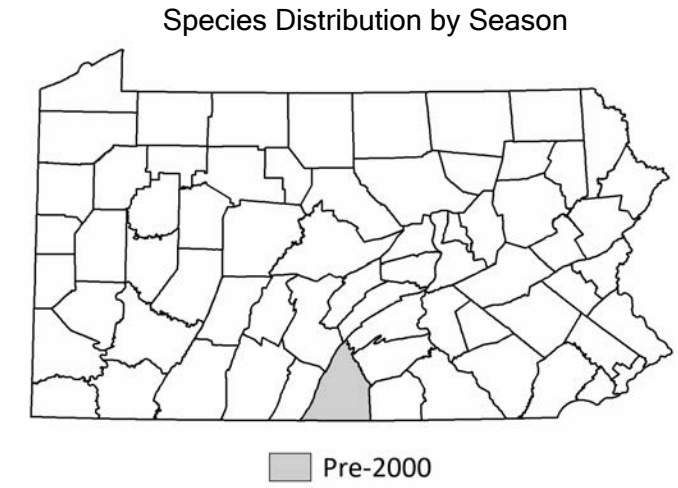
Shenandoah Valley Cave Amphipod

Stygobromus gracilipes

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: cave streams

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying

Threat Impact: Medium - Low

Specific Threat: Limestone mining could damage caves where this species occurs.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Consider this globally vulnerable species for state listing, so that the environmental review process could protect known sites from new limestone mines.

Objective: Do enough surveys for the species to determine a definitive state legal rank

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: the determination of a state legal rank

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: Physiographic Section: Great Valley

Other species likely to benefit from this action: other cave invertebrates; bats.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pizzini's Cave Amphipod

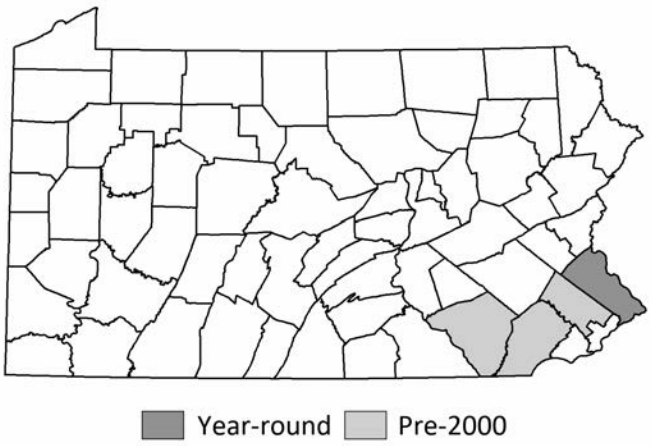
Stygobromus pizzinii

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G3G4

IUCN Red List Designation: Vulnerable

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: caves

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Medium

Specific Threat: Agriculture occurs within the immediate area with the occurrence. Streams near the occurrences are classified as Impaired from agriculture causes. Poor water quality in the cave/groundwater inputs or groundwater withdrawals could reduce the populations. Actual water pollution in the inhabited cave/springs/streams is unknown.

Action Category: Conserve specific land or seascapes

Specific Action: Protect lands that support rare cave invertebrates with land purchases or easements.

Objective: Work with willing landowners to protect priority sites

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of sites protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Section: Piedmont Upland, Piedmont Lowland, Gettysburg-Newark Lowland

Other species likely to benefit from this action: Cave crustaceans, cave flatworms, cave spiders, bats

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Medium - Low

Specific Threat: Limestone (and other minerals) is mined in the area; mining could damage the cave.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Consider this globally vulnerable species for state listing, so that the environmental review process could protect known sites from new limestone mines.

Objective: Perform enough surveys to determine a definitive state legal rank

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** determination of a state legal rank

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Piedmont, Atlantic Coastal Plain, Piedmont, Piedmont, Piedmont. Physiographic Section: Gettysburg-Newark Lowland, Lowland and Intermediate Upland, Piedmont Upland, Gettysburg-Newark Lowland, Piedmont Lowland

Other species likely to benefit from this action: other cave invertebrates; bats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Stellmack's Cave Amphipod

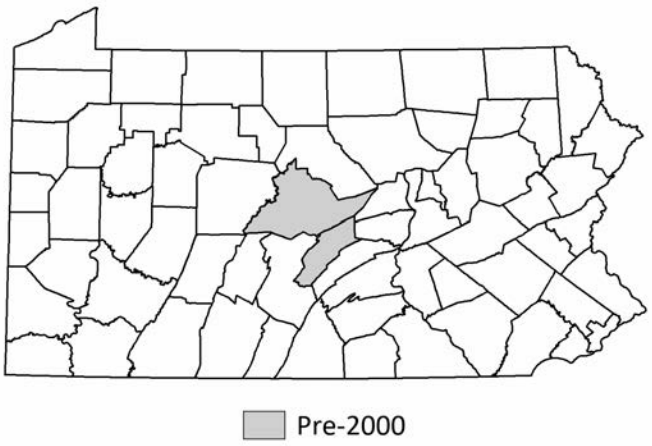
Stygobromus stellmacki

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G1G2

IUCN Red List Designation: Vulnerable

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: cave streams

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Medium - Low

Specific Threat: Limestone mining could damage caves supporting this species.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Consider this globally critically imperiled species for state listing, so that the environmental review process could protect known sites from new limestone mines.

Objective: Do enough surveys for this species to definitively determine a state legal rank

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** determination of a state legal rank

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: Statewide

Other species likely to benefit from this action: Cave invertebrates, bats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

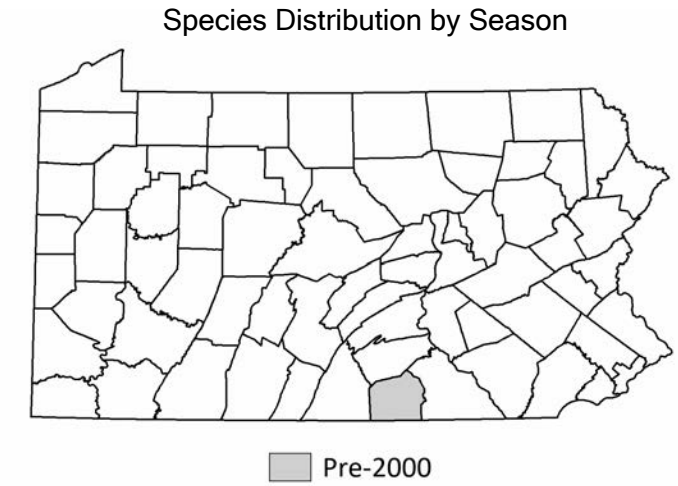
Potomac Groundwater Amphipod

Stygobromus tenuis potomacus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G4T4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: caves

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Low

Specific Threat: Agriculture occurs within the immediate area with the occurrences. Poor water quality in the cave/groundwater inputs or groundwater withdrawals could reduce the populations. Actual water pollution in the inhabited cave is unknown.

Action Category: Conserve specific land or seascapes

Specific Action: Protect lands that support rare cave invertebrates with land purchases or easements.

Objective: Work with willing landowners to protect priority sites

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of sites protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: Ridge and Valley. Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Cave crustaceans, cave flatworms, cave spiders, bats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Spinycheek Crayfish

Faxonius limosus

David A. Lieb ***PA Fish & Boat Commission / Western PA Conservancy***



Z. Loughman, West Liberty University

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent additional losses, particularly those resulting from invasive crayfish introductions and habitat degradation

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Data Deficient

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: In Pennsylvania F. limosus occurs or once occurred in running waters of ranging from small streams to large mainstem rivers, although the species is typically most common in medium to large streams and rivers and uncommon or absent in headwater streams. Within these systems the species is most common in slower flowing sections (e.g., pools, runs, and lateral near shore areas along banks) with adequate cover (e.g., rocky substrates, root masses, woody debris, leaf litter, submerged aquatic vegetation). The species tends to be rare or absent in highly modified urban stream reaches and those impacted by acid mine drainage.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Faxonius rusticus, , Faxonius virilis, and Faxonius obscurus) introduction.

Action Category: Outreach, communication and distribution

Specific Action: Implement a multi-media public outreach campaign on natural resource harms posed by invasive crayfish.

Objective: Inform the public on natural resource harms posed by invasive crayfish.

Action Priority: 1-Highest **Action Urgency:** **Measure:** Number of people reached.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Universities & research institutions

Locations: HUC6 Watershed: U. Delaware, Lower Delaware, U. Susquehanna, Lower Susquehanna

Other species likely to benefit from this action: All other native crayfishes; native amphibians

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Faxonius rusticus, , Faxonius virilis, and Faxonius obscurus) introduction.

Action Category: Mitigate human environmental impact

Specific Action: Work with willing dam owners to provide fish passage or remove dams to enhance American Eel migration and thus reduce non-native, invasive crayfish densities.

Objective: Increase Faxonius limosus relative abundance in streams where they occur.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5-10 years **Measure:** Faxonius limosus relative abundance.

Potential Collaborators: Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service

Locations: HUC6 Watershed: Lower Delaware, U. Delaware, U. Susquehanna, Lower Susquehanna

Other species likely to benefit from this action: Cambarus sp. C and Cambarus bartonii

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Faxonius rusticus, , Faxonius virilis, and Faxonius obscurus) introduction.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Determine if the species should be listed as threatened or endangered in Pennsylvania.

Objective: Work toward getting Faxonius limosus listed as endangered or threatened in Pennsylvania within the next 5-10 years.

Action Priority: 2-High **Action Urgency:** Initiate within 5-10 years **Measure:**

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: HUC6 Watershed: U. Delaware, Lower Delaware, U. Susquehanna, Lower Susquehanna

Other species likely to benefit from this action: Cambarus sp. C and Cambarus bartonii

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Faxonius rusticus, , Faxonius virilis, and Faxonius obscurus) introduction.

Action Category: Conservation funding

Specific Action: Secure funding to implement conservation initiatives.

Objective: Secure funding to implement one priority conservation initiative every 5 years.

Action Priority: 2-High **Action Urgency:** Initiate within 5-10 years **Measure:** Number of priority conservation initiatives completed.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Locations: HUC6 Watershed: U. Susquehanna, Lower Susquehanna, U. Delaware, Lower Delaware

Other species likely to benefit from this action: Cambarus sp. C and Cambarus bartonii

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** High - Low

Specific Threat: Loss or degradation of habitats due to agricultural and forestry effluents.

Action Category: Manage non-living habitat components

Specific Action: Work with farmers, facility managers, townships, foresters, lumber and agricultural industry, and other entities to reduce agricultural and forestry effluents discharged into drainages occupied by this species.

Objective: Within 10 years, reduce agricultural and forestry effluents discharged into drainages with Faxonius limosus.

Action Priority: 3-Medium **Action Urgency:** Can wait 10 years to initiate **Measure:** Miles of unimpaired streams as determined by PA DEP.

Potential Collaborators: Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC6 Watershed: U. Delaware, Lower Delaware, U. Susquehanna, Lower Susquehanna

Other species likely to benefit from this action: Cambarus sp. C and Cambarus bartonii

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Low

Specific Threat: Loss or degradation of habitats due to sedimentation, nutrients, pesticides, cultivation, land clearing resulting in hydrological and temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Work with farmers, facility managers, townships, the agricultural industry, and other entities to reduce annual and perennial non-timber crop effluents discharged into drainages occupied by this species.

Objective: Within 10 years, reduce discharges from annual and perennial non-timber crop operations into drainages with Faxonius limosus.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Miles of unimpaired streams as determined by PA DEP.

Potential Collaborators: Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC6 Watershed: U. Susquehanna, Lower Susquehanna, U. Delaware, Lower Delaware

Other species likely to benefit from this action: Cambarus bartonii

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** High - Low

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, commercial and industrial developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides), resulting in hydrological and temperature alterations.

Action Category: Conserve specific land or seascapes

Specific Action: Partner with willing landowners to permanently protect undeveloped lands occupied by Faxonius limosus.

Objective: Partner with 10 willing landowners in the next 5 years to permanently protect undeveloped lands in watersheds occupied by this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of acres protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Private Landowners

Locations: HUC6 Watershed: U. Delaware, Lower Delaware, Lower Susquehanna, U. Susquehanna

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** High - Low

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, commercial and industrial developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides), resulting in hydrological and temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Stream miles designated as unimpaired by PA DEP in occupied watersheds.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions

Locations: HUC6 Watershed: U. Susquehanna, Lower Susquehanna, U. Delaware, Lower Delaware

Other species likely to benefit from this action: Cambarus bartonii

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** High - Low

Specific Threat: Pollution (e.g., chlorine, ammonia, nutrients) from treated effluents, combine sewer-stormwater overflows, temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Work with facility managers, townships, developers, and other entities to reduce domestic and urban wastewater discharged into drainages occupied by this species.

Objective: Within 10 years, reduce domestic and urban wastewater discharges into drainages with Faxonius limosus.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Miles of unimpaired streams as determined by PA DEP.

Potential Collaborators: Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC6 Watershed: U. Delaware, Lower Delaware, U. Susquehanna, Lower Susquehanna

Other species likely to benefit from this action: Cambarus sp. C and Cambarus bartonii

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Low

Specific Threat: Highly variable flows due to severe floods and droughts, altering sediment regimes, changing physical habitats (e.g., stream substrate embeddedness).

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Stream miles designated as impaired by PA DEP in occupied watersheds.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions

Locations: HUC6 Watershed: U. Delaware, Lower Delaware, U. Susquehanna, Lower Susquehanna

Other species likely to benefit from this action: Cambarus sp. C and Cambarus bartonii

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** High - Low

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, commercial and industrial developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides), resulting in hydrological and temperature alterations.

Action Category: Conserve specific land or seascapes

Specific Action: Partner with willing landowners to permanently protect undeveloped lands occupied by Faxonius limosus.

Objective: Partner with 10 willing landowners in the next 5 years to permanently protect undeveloped lands in watersheds occupied by this species.

Action Priority: 3-Medium **Action Urgency:** Can wait 10 years to initiate **Measure:** Number of acres protected.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Private Landowners

Locations: HUC6 Watershed: Lower Susquehanna, U. Susquehanna, Lower Delaware, U. Delaware

Other species likely to benefit from this action: Cambarus bartonii

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** High - Low

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, commercial and industrial developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides), resulting in hydrological and temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: 3-Medium **Action Urgency:** Can wait 10 years to initiate **Measure:** Stream miles designated as unimpaired by PA DEP.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Universities & research institutions

Locations: HUC6 Watershed: Lower Susquehanna, U. Susquehanna, U. Delaware, Lower Delaware

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** High - Low

Specific Threat: Loss or degradation of stream and river habitats due to sedimentation, nutrients, pesticides, and hydrological and temperature alterations from livestock and ranching operations.

Action Category: Manage non-living habitat components

Specific Action: Work with facility managers, townships, livestock farmers, ranchers and producers, the agricultural industry and other entities to reduce livestock and ranching effluents discharged into drainages occupied by this species.

Objective: Within 10 years, reduce livestock farming and ranching discharges into drainages with Faxonius limosus.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Miles of unimpaired streams as determined by PA DEP.

Potential Collaborators: Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC6 Watershed: U. Susquehanna, Lower Susquehanna, Lower Delaware, U. Delaware

Other species likely to benefit from this action: Cambarus bartonii

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** High - Low

Specific Threat: Highly variable flows due to severe floods and droughts, altering sediment regimes, changing physical habitats (e.g., stream substrate embeddedness).

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Stream miles designated as impaired by PA DEP in occupied watersheds.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC6 Watershed: U. Delaware, Lower Delaware, U. Susquehanna, Lower Susquehanna

Other species likely to benefit from this action: Cambarus sp. C and Cambarus bartonii

Season: Year-round

Priority	Need	Partners
1	Determine methods to eliminate or greatly reduce populations of invasive crayfishes in watersheds with Faxonius limosus	Universities & research institutions, Pennsylvania Fish and Boat Commission
2	Determine if populations of Faxonius limosus in the Susquehanna drainage are native or introduced.	Pennsylvania Fish and Boat Commission, Universities & research institutions
3	Determine the impacts of urbanization on populations of Faxonius limosus	Universities & research institutions, Pennsylvania Fish and Boat Commission
4	Determine the impacts of high flow events on Faxonius limosus	Universities & research institutions, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	Determine if Faxonius limosus occurs in any drainages in PA from which it is currently not known	Universities & research institutions, Pennsylvania Fish and Boat Commission
2	Within watersheds in Pennsylvania where Faxonius limosus occurs, survey stream reaches that have not yet been surveyed.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Monitoring Faxonius limosus and invasive crayfishes (if present) at sites across Pennsylvania where the species occurs

Lead(s) :

Link: N/A

Description: Measure abundance of Faxonius limosus periodically (e.g. every 1-5 years) at sites in both drainages in Pennsylvania where Faxonius propinquus occurs (Delaware and Susquehanna). Methods utilized in the most recent survey of western and eastern PA crayfishes (10 seine hauls per site) can be repeated at known sites (Loughman et al. 2020, D.A. Lieb and Z.J. Loughman, unpublished data).

Monitoring Need: The monitoring is done to ensure that F. limosus is not declining across its range in Pennsylvania.

Bouchard RW, Lieb DA, Carline RF, Nuttall TR, Wengert CB, Wallace JR. 2007. 101 Years of change (1906 to 2007). The distribution of the crayfishes of Pennsylvania. Part I. Eastern Pennsylvania. Academy of Natural Sciences of Philadelphia, Report No. 07–11, Philadelphia, Pennsylvania.

Filipová, L., D. A. Lieb, F. Grandjean, and A. Petrusek. 2011. Haplotype variation in the spiny-cheek crayfish Orconectes limosus: colonization of Europe and genetic diversity of native stocks. Journal of the North American Benthological Society 30: 871–881.

Lieb, D. A., R. W. Bouchard, and R. F. Carline. 2011. The crayfish fauna of southeastern Pennsylvania: distributions, ecology, and changes over the last century. Journal of Crustacean Biology 31:166–178.

Lieb, D.A., R.W. Bouchard, R.F. Carline, T.R. Nuttall, J.R. Wallace, and C.B. Wengert. 2011. Conservation and management of crayfishes: lessons from Pennsylvania. Fisheries 36: 489-507.

Ortmann, AE. 1906. The crawfishes of the state of Pennsylvania. Memoirs of the Carnegie Museum 2: 343–523.

PENNSYLVANIA WILDLIFE ACTION PLAN

Digger Crayfish

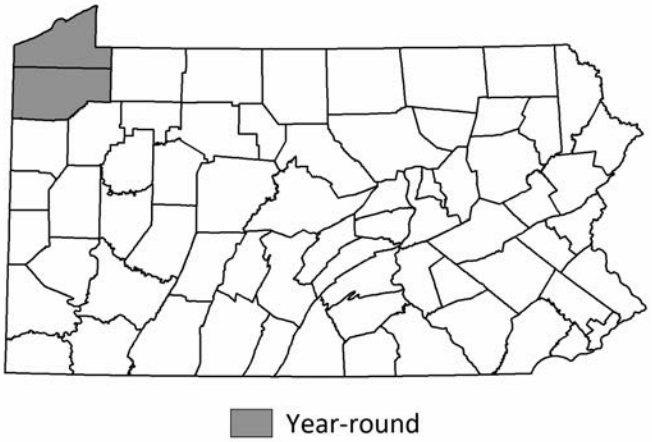
Creaserinus fodiens

David A. Lieb — *PA Fish & Boat Commission / Western PA Conservancy*



T. Khan, West Liberty University

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain exiting populations and prevent losses resulting from habitat loss and degradation, invasive crayfish introductions, and other anthropogenic impacts.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Creaserinus fodiens is a burrowing crayfish species that, in Pennsylvania, typically occurs within or adjacent to roadside ditches, ephemeral (vernal) pools, seeps, wetlands, small streams, and other wet areas in locations where the ground water is relatively close to the surface allowing C. foldiens to dig burrows through moist soils to reach the underlying ground water.

Primary Habitat: Subterranean

Primary Habitat Type: Other Subterranean

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Very High - Medium

Specific Threat: Degraded habitats (e.g., ditches, wetlands, seeps) adjacent to roadways due to contaminants (e.g., deicing materials, pesticides, nutrients, heavy metals).

Action Category: Manage non-living habitat components

Specific Action: Reduce use of herbicides, insecticides, biocides, road salts, and other toxic chemicals along roadways, associated ditches, and adjacent habitats and avoid habitat alteration of any kind in those habitats.

Objective: Maintain and improve populations of this species in habitats along roadways.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of C. fodiens colonies protected.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Geological Survey

Locations: HUC6 Watershed: E. Lake Erie, S. Lake Erie, U. Ohio-Beaver

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Determine the impacts of anthropogenic factors on populations of Creaserinus fodiens and develop methods to eliminate or lesson those impacts.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Although intensive surveys targeting Creaserinus fodiens in Pennsylvania were conducted by Khan et al. (2020), additional surveys to even more precisely determine the distribution and conservation status of C. fodiens in Pennsylvania could be conducted. Efforts to collect C. fodiens from sites within the range of the species where burrows were observed by Khan et al. (2020) but specimens were not collected could be targeted.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Monitor known populations of Creaserinus fodiens across its range in Pennsylvania.

Lead(s) : PFBC

Link: N/A

Description: Monitor known populations of Creaserinus fodiens across its range in Pennsylvania.

Monitoring Need: The monitoring is done to ensure that C. fodiens is not declining across its range in Pennsylvania

Khan, T.N., Lieb, D.A. and Loughman, Z.L. 2020. Distribution and conservation status of the digger crayfish (Creaserinus fodiens, Cottle 1863) in Pennsylvania. Final Report submitted to the Pennsylvania Wild Resource Conservation Program. Department of Conservation and Natural Resources. Harrisburg, PA., 1–85 pp.

Loughman ZJ, Lieb DA, Sykes AM, Khan TN, Allison PF Jr. 2020. Western Pennsylvania crayfish inventory and conservation assessment. Harrisburg, PA: Final Report submitted to the Pennsylvania Fish and Boat Commission. i–396.

Loughman, Z.J., P. Woods, and D.A. Lieb. 2018. First record of Creaserinus fodiens (Digger Crayfish) from Pennsylvania. Northeastern Naturalist 25(2): N15–N18.

PENNSYLVANIA WILDLIFE ACTION PLAN

Enigma Crayfish

Cambarus emegi

David A. Lieb

PA Fish & Boat Commission / Western PA Conservancy



Z. Loughman, West Liberty University

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: prevent additional losses resulting from invasive crayfish introductions and habitat degradation

NatureServe Global Rank:

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend: Not Assessed

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-50%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Inhabits lotic systems from headwater streams to small rivers that tend to be moderate gradient and cool. Prefers rocky, unembedded substrates with slow to moderate flows. Tends to be rare or absent in highly modified urban stream reaches.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Faxonius rusticus).

Action Category: Outreach, communication and distribution

Specific Action: Implement a multi-media public outreach campaign on natural resource harms posed by invasive crayfish.

Objective: Inform the public on natural resource harms posed by invasive crayfish.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of people reached.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Universities & research institutions

Locations: HUC10 Watershed: Darby Cr.-Mantua Cr., Lower Schuylkill R., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr.

Other species likely to benefit from this action: All other native crayfish; native amphibians

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Faxonius rusticus).

Action Category: Manage non-living habitat components

Specific Action: Increase American Eel migration by working with willing dam owners to enhance fish passage or remove dams.

Objective: Increase Cambarus emegi populations in streams where they occur.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Cambarus emegi relative abundance.

Potential Collaborators: Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: HUC10 Watershed: Darby Cr.-Mantua Cr., Raccoon Cr.-Delaware R., Lower Schuylkill R., Brandywine Cr., E. Br. Brandywine Cr.

Other species likely to benefit from this action: Faxonius limosus and Cambarus bartonii

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Faxonius rusticus).

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Compile and assess available data to determine if the species should be listed as threatened or endangered in Pennsylvania.

Objective: Determine if the species should be listed as threatened or endangered in Pennsylvania.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:**

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: HUC10 Watershed: Lower Schuylkill R., Darby Cr.-Mantua Cr., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr.

Other species likely to benefit from this action: Faxonius limosus and Cambarus bartonii

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Faxonius rusticus).

Action Category: Conservation funding

Specific Action: Secure funding to implement conservation initiatives.

Objective: Secure funding to implement one priority conservation initiative every 5 years.

Action Priority: 2-High **Action Urgency:** Initiate within 5-10 years **Measure:** Number of priority conservation initiatives completed.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Locations: HUC10 Watershed: Lower Schuylkill R., Darby Cr.-Mantua Cr., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr.

Other species likely to benefit from this action: Faxonius limosus and Cambarus bartonii

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** High - Medium

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, commercial and industrial developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides), resulting in hydrological and temperature alterations.

Action Category: Conserve specific land or seascapes

Specific Action: Partner with willing landowners to permanently protect undeveloped lands in the lower Delaware River watersheds occupied by this species.

Objective: Partner with 10 willing landowners in the next 5 years to permanently protect undeveloped lands in the lower Delaware River watersheds occupied by this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of acres protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Private Landowners

Locations: HUC10 Watershed: Darby Cr.-Mantua Cr., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr., Lower Schuylkill R.

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** High - Medium

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, commercial and industrial developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides), resulting in hydrological and temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Stream miles designated as unimpaired by PA DEP in occupied watersheds.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions

Locations: HUC10 Watershed: Darby Cr.-Mantua Cr., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr., Lower Schuylkill R.

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** High - Low

Specific Threat: Pollution (e.g., chlorine, ammonia, nutrients) from treated effluents, combine sewer-stormwater overflows, temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Work with facility managers, townships, developers, and other entities to reduce domestic and urban wastewater discharged into drainages occupied by this species.

Objective: Within 10 years, reduce concentration of domestic and urban wastewater discharged into drainages with Cambarus emegi.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Miles of unimpaired streams as determined by PA DEP

Potential Collaborators: Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC10 Watershed: Darby Cr.-Mantua Cr., Lower Schuylkill R., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr.

Other species likely to benefit from this action: Faxonius limosus and Cambarus bartonii

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Low

Specific Threat: Highly variable flows due to severe floods and droughts, altering sediment regimes, changing physical habitats (e.g., stream substrate embeddedness).

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Stream miles designated as impaired by PA DEP in occupied watersheds.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions

Locations: HUC10 Watershed: Lower Schuylkill R., Darby Cr.-Mantua Cr., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr.

Other species likely to benefit from this action: Faxonius limosus and Cambarus bartonii

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** High

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, residential developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides),resulting in hydrological and temperature alterations.

Action Category: Conserve specific land or seascapes

Specific Action: Partner with willing landowners to permanently protect undeveloped lands in the lower Delaware River watersheds occupied by this species.

Objective: Partner with 10 willing landowners in the next 5 years to permanently protect undeveloped lands in the lower Delaware River watersheds occupied by this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of acres protected

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Private Landowners

Locations: HUC10 Watershed: Darby Cr.-Mantua Cr., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr., Lower Schuylkill R.

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** High

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, residential developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides),resulting in hydrological and temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Stream miles designated as unimpaired by PA DEP.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions

Locations: HUC10 Watershed: Darby Cr.-Mantua Cr., Lower Schuylkill R., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr.

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** High - Low

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads), multiple types of pollution (e.g., deicing materials, hydrocarbons, heavy metals), hydrological and temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Stream miles designated as impaired by PA DEP in occupied watersheds.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Universities & research institutions

Locations: HUC10 Watershed: Darby Cr.-Mantua Cr., Lower Schuylkill R., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr.

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** High - Low

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads), multiple types of pollution (e.g., deicing materials, hydrocarbons, heavy metals), hydrological and temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Work with transportation authorities to avoid or minimize excessive runoff from roads and railway rights-of-way into habitats occupied by this species.

Objective: Maintain or expand capture of road and railway rights-of-way runoff in detention basins or similar structures.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Cumulative functional capacity of water detention structures in each occupied watershed.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Universities & research institutions

Locations: HUC10 Watershed: Darby Cr.-Mantua Cr., Lower Schuylkill R., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr.

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** High - Low

Specific Threat: Highly variable flows due to severe floods and droughts, altering sediment regimes, changing physical habitats (e.g., stream substrate embeddedness).

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Stream miles designated as impaired by PA DEP in occupied watersheds.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC10 Watershed: Darby Cr.-Mantua Cr., Lower Schuylkill R., Raccoon Cr.-Delaware R., Brandywine Cr., E. Br. Brandywine Cr.

Other species likely to benefit from this action: Faxonius limosus and Cambarus bartonii

Season: Year-round

Priority	Need	Partners
1	Determine method to eliminate or greatly reduce populations of invasive crayfishes in watersheds with Cambarus emegi.	Universities & research institutions, Pennsylvania Fish and Boat Commission
2	Definitively determine if Cambarus emegi is native or introduced to Pennsylvania	Universities & research institutions, Pennsylvania Fish and Boat Commission
3	Determine the impacts of urbanization on populations of Cambarus emegi.	Universities & research institutions, Pennsylvania Fish and Boat Commission
4	Determine the impacts of high flow events on Cambarus emegi.	Universities & research institutions, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	Determine if Cambarus emegi occurs in any drainages in PA from which it is currently not known	Universities & research institutions, Pennsylvania Fish and Boat Commission
2	Within watersheds in Pennsylvania where Cambarus emegi occurs, survey stream reaches that have not yet been surveyed.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Monitoring Cambarus emegi and invasive crayfishes (if present) at selected sites in the Pickering and Crum Creek drainages as well as sites in the other drainages in Pennsylvania where the species occurs.

Lead(s) : PFBC

Link: N/A

Description: Sites in the Pickering and Crum Creek drainages that currently support or formerly supported populations of Cambarus emegi have been sampled for crayfishes once annually since 2019. The density of all crayfish species that occur at each site is measured. This program can be expanded to sites in other drainages in Pennsylvania where the species occurs

Comments: The monitoring is done to assess the impact of invasive crayfish on populations of Cambarus emegi.

Bouchard RW, Lieb DA, Carline RF, Nuttall TR, Wengert CB, Wallace JR. 2007. 101 Years of change (1906 to 2007). The distribution of the crayfishes of Pennsylvania. Part I. Eastern Pennsylvania. Academy of Natural Sciences of Philadelphia, Report No. 07–11, Philadelphia, Pennsylvania.

Lieb, D. A., R. F. Carline, J. L. Rosenberger, and V. M. Mengel. 2008. The discovery and ecology of a member of the Cambarus acuminatus complex (Decapoda: Cambaridae) in Valley Creek, southeastern Pennsylvania. Journal of Crustacean Biology 28:439–450.

Lieb, D. A., R. W. Bouchard, and R. F. Carline. 2011. The crayfish fauna of southeastern Pennsylvania: distributions, ecology, and changes over the last century. Journal of Crustacean Biology 31:166–178.

Lieb, D.A., B.W. Williams, D.A. Foltz II, and Z.J. Loughman. 2026a. Description of a new stream-dwelling species of Cambarus (Decapoda: Cambaridae) from Virginia and Pennsylvania (USA) with notes on its distribution, ecology, and conservation status. Zootaxa 5857: 299–316.

Lieb, D.A., R.W. Bouchard, R.F. Carline, T.R. Nuttall, J.R. Wallace, and C.B. Wengert. 2011. Conservation and management of crayfishes: lessons from Pennsylvania. Fisheries 36: 489-507.

Ortmann AE. 1906. The crawfishes of the state of Pennsylvania. Memoirs of the Carnegie Museum 2: 343–523.

Williams, B.W., Z.J. Loughman, and D.A. Lieb. 2020. Taxonomy and conservation status of Cambarus (Puncticambarus) sp. in Pennsylvania. - Final Report for Project Number F16AF01305. Submitted to Pennsylvania Fish & Boat Commission, Bellefonte, Pennsylvania. 50 pp.

PENNSYLVANIA WILDLIFE ACTION PLAN

Little Brown Mudbug

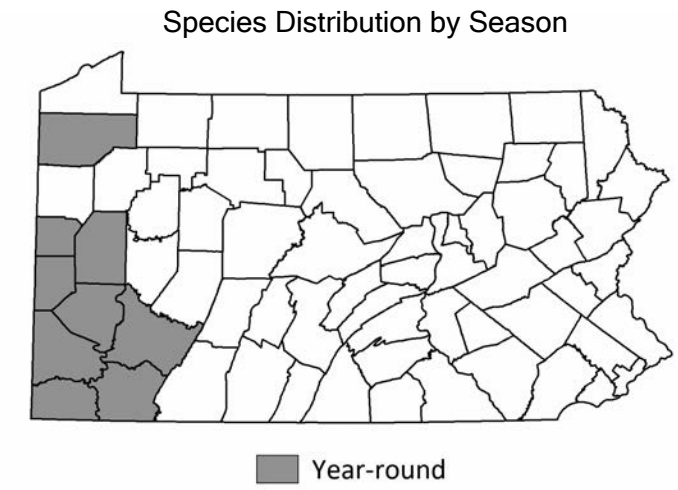
Lacunicambarus thomai

David A. Lieb

PA Fish & Boat Commission / Western PA Conservancy



Z. Loughman, West Liberty University



Conservation Profile

PA 10-Year Conservation Goal: Maintain exiting populations and prevent losses resulting from invasive crayfish introductions, habitat loss and degradation, and other anthropogenic impacts

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Lacunicambarus thomai is a burrowing crayfish species that occurs in areas where the ground water is relatively close to the surface and soils have substantial clay content often in bottom land flood plains in the vicinity of rivers as well as streams including headwater streams, seeps, and other wet areas. Additionally, the species frequently occurs in roadside ditches or in/near small streams, wetlands and seeps adjacent to roadways and has been collected from the banks of standing waters (e.g. lakes), although less frequently.

Primary Habitat: Subterranean

Primary Habitat Type: Other Subterranean

Primary Specific Habitat: NA

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: High - Low

Specific Threat: Loss or degradation of habitats (e.g., ditches, wetlands, seeps, vernal pools, small headwater streams) due to sediments, nutrients, pesticides, other pollutants.

Action Category: Manage non-living habitat components

Specific Action: Reduce use of herbicides, insecticides, biocides, road salts, and other toxic chemicals along roadways, associated ditches, and adjacent habitats and avoid habitat alteration of any kind in those habitats.

Objective: Maintain and improve populations of this species in habitats along roadways.

Action Priority: 3-Medium

Action Urgency: Can wait 10 years to initiate

Measure: Number of L. thomai colonies protected.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Geological Survey

Locations: HUC6 Watershed: Monongahela, Allegheny, U. Ohio-Beaver

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Determine the impacts of anthropogenic factors on populations of Lacunicambarus thomai and develop methods to eliminate or lesson those impacts.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Build on available information from past surveys to determine the precise distribution and conservation status of Lacunicambarus thomai in Pennsylvania.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Monitor known populations of Lacunicambarus thomai across its range in Pennsylvania **Lead(s) :** PFBC

Link: N/A

Description: Monitor known populations of Lacunicambarus thomai across its range in Pennsylvania

Monitoring Need: The monitoring is done to ensure that L. thomai is not declining across its range in Pennsylvania.

Allison, P.F., Jr, D.A. Lieb and Z.J. Loughman. 2022. Distribution, natural history, and conservation of Cambarus dubius in Pennsylvania. Journal of Natural History 56: 829-848.

Allison, PF, Jr., Khan, TN, Davis, DA, Lieb, DA, Loughman, ZJ. 2021. Review of the distribution and new occurrences of Lacunicambarus thomai (Jezerinac, 1993) (Decapoda, Cambaridae) in Pennsylvania and its possible introduction outside of its native range. Check List 17 (6): 1461–1473.

Bouchard RW, Lieb DA, Carline RF, Nuttall TR, Wengert CB, Wallace JR. 2007. 101 Years of change (1906 to 2007). The distribution of the crayfishes of Pennsylvania. Part I. Eastern Pennsylvania. Academy of Natural Sciences of Philadelphia, Report No. 07–11, Philadelphia, Pennsylvania.

Loughman ZJ, Lieb DA, Scott RK, Dillard ZW, Sadecky NM. 2017. Historical and current distribution of Appalachian primary burrowing crayfishes (Decapoda: Astacoidea: Cambaridae) in western Pennsylvania: a century of change or stasis? Journal of Crustacean Biology 37: 535–543.

Loughman ZJ, Lieb DA, Sykes AM, Khan TN, Allison PF Jr. 2020. Western Pennsylvania crayfish inventory and conservation assessment. Harrisburg, PA: Final Report submitted to the Pennsylvania Fish and Boat Commission. i–396.

Ortmann, AE. 1906. The crawfishes of the state of Pennsylvania. Memoirs of the Carnegie Museum 2: 343–523.

PENNSYLVANIA WILDLIFE ACTION PLAN

Big Water Crayfish

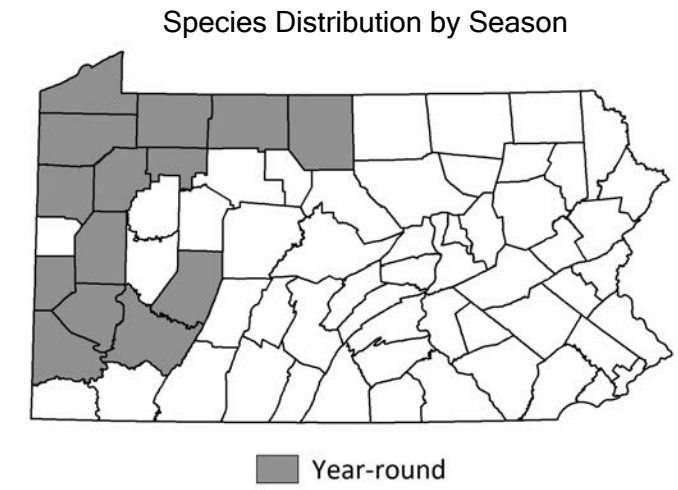
Cambarus robustus

David A. Lieb

PA Fish & Boat Commission / Western PA Conservancy



Z. Loughman, West Liberty University



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations and range

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Most abundant in medium to large flowing waters with unembedded rocky substrates including large slab boulders and good habitat and water quality; also occurs in smaller flowing waters with similar attributes.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Small River

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High

Specific Threat: Non-native crayfish (Faxonius rusticus) introduction in Erie and Ohio River Basins.

Action Category: Outreach, communication and distribution

Specific Action: Implement a multi-media public outreach campaign on natural resource harms posed by invasive crayfish.

Objective: Inform the public on natural resource harms posed by invasive crayfish.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of people reached.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Universities & research institutions

Locations: HUC6 Watershed: Allegheny, U. Ohio-Beaver, Monongahela, E. Lake Erie, W. Br. Susquehanna

Other species likely to benefit from this action: All other native crayfish; native amphibians

Season: Year-round

Priority	Need	Partners
1	Determine if populations of Cambarus robustus in the Susquehanna drainage are native or introduced.	Universities & research institutions, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	Determine if Cambarus robustus occurs in any drainages in PA from which it is currently not known	Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Within watersheds in Pennsylvania where Cambarus robustus occurs, survey stream reaches that have not yet been surveyed	Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Monitor known populations of Cambarus robustus across its range in Pennsylvania

Lead(s) :

Link: N/A

Description: Measure abundance of Cambarus robustus periodically (e.g. every 1-5 years) at sites in all three drainages in Pennsylvania where Cambarus robustus occurs (Ohio, Erie, Susquehanna). Methods utilized in the most recent survey of western PA crayfishes (10 seine hauls per site) can be repeated at known sites (Loughman et al. 2020).

Monitoring Need: The monitoring is done to ensure that C. robustus is not declining across its range in Pennsylvania.

Bouchard RW, Lieb DA, Carline RF, Nuttall TR, Wengert CB, Wallace JR. 2007. 101 Years of change (1906 to 2007). The distribution of the crayfishes of Pennsylvania. Part I. Eastern Pennsylvania. Academy of Natural Sciences of Philadelphia, Report No. 07–11, Philadelphia, Pennsylvania.

Loughman ZJ, Lieb DA, Sykes AM, Khan TN, Allison PF Jr. 2020. Western Pennsylvania crayfish inventory and conservation assessment. Harrisburg, PA: Final Report submitted to the Pennsylvania Fish and Boat Commission. i–396.

Ortmann, AE. 1906. The crawfishes of the state of Pennsylvania. Memoirs of the Carnegie Museum 2: 343–523.

PENNSYLVANIA WILDLIFE ACTION PLAN

Upland Burrowing Crayfish

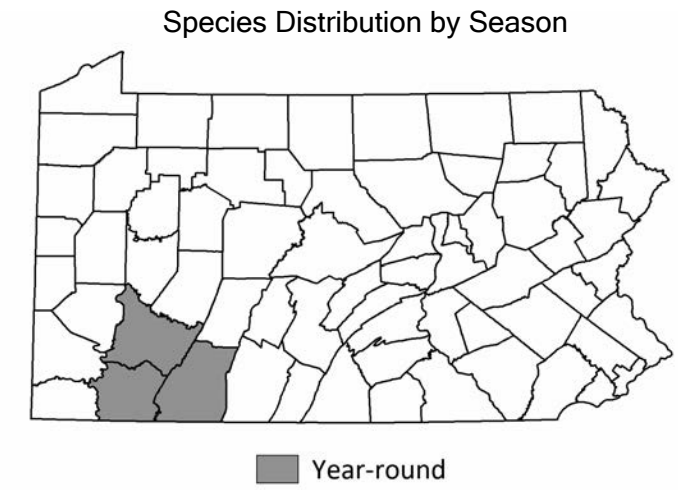
Cambarus dubius

David A. Lieb

PA Fish & Boat Commission / Western PA Conservancy



Z. Loughman, West Liberty University



Conservation Profile

PA 10-Year Conservation Goal: Maintain exiting populations and prevent losses resulting from invasive crayfish introductions, habitat loss and degradation, and other anthropogenic impacts

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Cambarus dubius is a burrowing crayfish species that occurs in areas where the ground water is relatively close to the surface and soils have substantial clay content often in flood plains in the vicinity of streams including headwater streams as well as within or adjacent to seeps, and other wet areas. Additionally, the species frequently occurs in roadside ditches or in or near streams, wetlands and seeps adjacent to roadways.

Primary Habitat: Subterranean

Primary Habitat Type: Other Subterranean

Primary Specific Habitat: NA

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** High - Low

Specific Threat: Loss or degradation of habitats (e.g., ditches, wetlands, seeps, vernal pools, small headwater streams) due to sediments, nutrients, pesticides, other pollutants.

Action Category: Manage non-living habitat components

Specific Action: Reduce use of herbicides, insecticides, biocides, road salts, and other toxic chemicals along roadways, associated ditches, and adjacent habitats and avoid habitat alteration of any kind in those habitats.

Objective: Maintain and improve populations of this species in habitats along roadways.

Action Priority: 3-Medium **Action Urgency:** Can wait 10 years to initiate **Measure:** Number of C. dubius colonies protected.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Geological Survey

Locations: HUC6 Watershed: Monongahela, Allegheny, U. Ohio-Beaver

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Determine the impacts of anthropogenic factors on populations of Cambarus dubius and develop methods to eliminate or lesson those impacts.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Although intensive surveys targeting Cambarus dubius in Pennsylvania were conducted in 2019 (Allison et al. 2022), additional surveys to even more precisely determine the distribution and conservation status of Cambarus dubius in Pennsylvania could be conducted. Efforts to collect C. dubius from sites within the range of the species where burrows were observed by Allison et al. (2022) but specimens were not collected could be targeted.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Monitor known populations of Cambarus dubius across its range in Pennsylvania **Lead(s) :** PFBC

Link: N/A

Description: Monitor known populations of Cambarus dubius across its range in Pennsylvania

Monitoring Need: The monitoring is done to ensure that C. dubius is not declining across its range in Pennsylvania

Allison, P.F., Jr, D.A. Lieb and Z.J. Loughman. 2022. Distribution, natural history, and conservation of Cambarus dubius in Pennsylvania. Journal of Natural History 56: 829-848.

Allison, PF, Jr., Khan, TN, Davis, DA, Lieb, DA, Loughman, ZJ. 2021. Review of the distribution and new occurrences of Lacunicambarus thomai (Jezerinac, 1993) (Decapoda, Cambaridae) in Pennsylvania and its possible introduction outside of its native range. Check List 17 (6): 1461–1473.

Bouchard RW, Lieb DA, Carline RF, Nuttall TR, Wengert CB, Wallace JR. 2007. 101 Years of change (1906 to 2007). The distribution of the crayfishes of Pennsylvania. Part I. Eastern Pennsylvania. Academy of Natural Sciences of Philadelphia, Report No. 07–11, Philadelphia, Pennsylvania.

Loughman ZJ, Lieb DA, Scott RK, Dillard ZW, Sadecky NM. 2017. Historical and current distribution of Appalachian primary burrowing crayfishes (Decapoda: Astacoidea: Cambaridae) in western Pennsylvania: a century of change or stasis? Journal of Crustacean Biology 37: 535–543.

Loughman ZJ, Lieb DA, Sykes AM, Khan TN, Allison PF Jr. 2020. Western Pennsylvania crayfish inventory and conservation assessment. Harrisburg, PA: Final Report submitted to the Pennsylvania Fish and Boat Commission. i–396.

Ortmann, AE. 1906. The crawfishes of the state of Pennsylvania. Memoirs of the Carnegie Museum 2: 343–523.

PENNSYLVANIA WILDLIFE ACTION PLAN

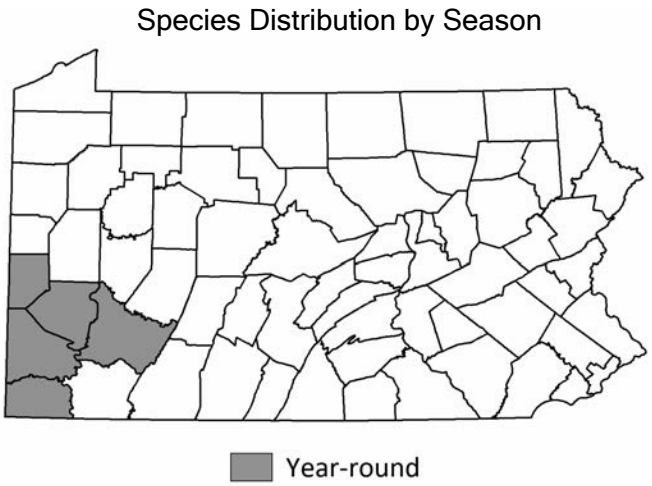
Blue Crayfish

Cambarus monongalensis

David A. Lieb — *PA Fish & Boat Commission / Western PA Conservancy*



Z. Loughman, West Liberty University



Conservation Profile

PA 10-Year Conservation Goal: Maintain exiting populations and prevent losses resulting from invasive crayfish introductions, habitat loss and degradation, and other anthropogenic impacts

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Cambarus monongalensis is a burrowing crayfish species that occurs in areas where the ground water is relatively close to the surface and soils have substantial clay content often in flood plains in the vicinity of streams including headwater streams as well as within or adjacent to seeps, and other wet areas. Additionally, the species frequently occurs in roadside ditches or in or near streams, wetlands and seeps adjacent to roadways.

Primary Habitat: Subterranean

Primary Habitat Type: Other Subterranean

Primary Specific Habitat: NA

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** High - Low

Specific Threat: Loss or degradation of habitats (e.g., ditches, wetlands, seeps, vernal pools, small headwater streams) due to sediments, nutrients, pesticides, other pollutants.

Action Category: Manage non-living habitat components

Specific Action: Reduce use of herbicides, insecticides, biocides, road salts, and other toxic chemicals along roadways, associated ditches, and adjacent habitats and avoid habitat alteration of any kind in those habitats.

Objective: Maintain and improve populations of this species in habitats along roadways.

Action Priority: 3-Medium **Action Urgency:** Can wait 10 years to initiate **Measure:** Number of C. monongalensis colonies protected.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Geological Survey

Locations: HUC6 Watershed: Monongahela, Allegheny, U. Ohio-Beaver

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Determine the impacts of anthropogenic factors on populations of Cambarus monongalensis and develop methods to eliminate or lesson those impacts.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Build on available information from past surveys to determine the precise distribution and conservation status of Cambarus monongalensis in Pennsylvania.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Monitor known populations of Cambarus monongalensis across its range in Pennsylvania **Lead(s) :**

Link: N/A

Description: Monitor known populations of Cambarus monongalensis across its range in Pennsylvania

Monitoring Need: The monitoring is done to ensure that C. monongalensis is not declining across its range in Pennsylvania.

Allison, P.F., Jr, D.A. Lieb and Z.J. Loughman. 2022. Distribution, natural history, and conservation of Cambarus dubius in Pennsylvania. Journal of Natural History 56: 829-848.

Allison, PF, Jr., Khan, TN, Davis, DA, Lieb, DA, Loughman, ZJ. 2021. Review of the distribution and new occurrences of Lacunicambarus thomai (Jezerinac, 1993) (Decapoda, Cambaridae) in Pennsylvania and its possible introduction outside of its native range. Check List 17 (6): 1461–1473.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Devil Crawfish

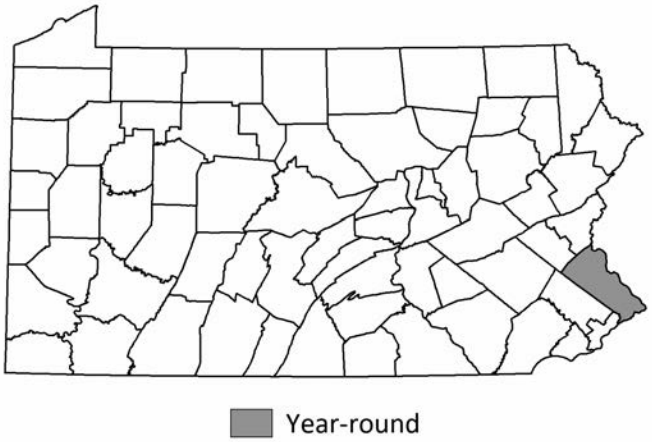
Lacunicambarus diogenes

David A. Lieb — *PA Fish & Boat Commission / Western PA Conservancy*



Z. Graham, West Liberty University

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain exiting populations and prevent losses resulting from invasive crayfish introductions, habitat loss and degradation, and other anthropogenic impacts

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Data Deficient

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Lacunicambarus diogenes is a burrowing crayfish species that occurs in areas where the ground water is relatively close to the surface and soils have substantial clay content often in the vicinity of flowing waters including headwater streams and seeps as well as wetlands.

Primary Habitat: Subterranean

Primary Habitat Type: Other Subterranean

Primary Specific Habitat: NA

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** High

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, commercial and industrial developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides), resulting in hydrological and temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority:

Action Urgency: Initiate within 5-10 years

Measure: Stream miles designated as unimpaired by PA DEP in occupied watersheds.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions

Locations:

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** High

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, residential developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides),resulting in hydrological and temperature alterations.

Action Category: Conserve specific land or seascapes

Specific Action: Partner with willing landowners to permanently protect undeveloped lands occupied by Faxonius limosus.

Objective: Partner with 10 willing landowners in the next 5 years to permanently protect undeveloped lands in watersheds occupied by this species.

Action Priority:

Action Urgency: Initiate within 5-10 years

Measure: Number of acres protected.

Potential Collaborators: Private Landowners, Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources

Locations:

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** High

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, residential developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides),resulting in hydrological and temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: **Action Urgency:** Initiate within 5-10 years **Measure:** Stream miles designated as unimpaired by PA DEP.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Universities & research institutions

Locations:

Other species likely to benefit from this action: Spinycheek Crayfish

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Procambaurs clarkii).

Action Category: Outreach, communication and distribution

Specific Action: Implement a multi-media public outreach campaign on natural resource harms posed by invasive crayfish.

Objective: Inform the public on natural resource harms posed by invasive crayfish.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of people reached.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Universities & research institutions

Locations: HUC8 Watershed: Lower Delaware, Crosswicks-Neshaminy, Schuylkill

Other species likely to benefit from this action: All other native crayfish; native amphibians

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Procambaurs clarkii).

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Compile and assess available data to determine if the species should be listed as threatened or endangered in Pennsylvania.

Objective: Determine if the species should be listed as threatened or endangered in Pennsylvania.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:**

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Lower Delaware, Crosswicks-Neshaminy, Schuylkill

Other species likely to benefit from this action: Faxonius limosus and Cambarus bartonii

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish (Procambaurs clarkii).

Action Category: Conservation funding

Specific Action: Secure funding to implement conservation initiatives.

Objective: Secure funding to implement one priority conservation initiative every 5 years.

Action Priority: 2-High **Action Urgency:** Initiate within 5-10 years **Measure:** Number of priority conservation initiatives completed.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Locations: HUC8 Watershed: Lower Delaware, Crosswicks-Neshaminy, Schuylkill

Other species likely to benefit from this action: Faxonius limosus and Cambarus bartonii

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** High

Specific Threat: Habitat degradation due to impervious surfaces (e.g., roads, commercial and industrial developments), multiple types of pollution (e.g., deicing materials, hydrocarbons, pesticides), resulting in hydrological and temperature alterations.

Action Category: Conserve specific land or seascapes

Specific Action: Partner with willing landowners to permanently protect undeveloped lands occupied by Faxonius limosus.

Objective: Partner with 10 willing landowners in the next 5 years to permanently protect undeveloped lands in watersheds occupied by this species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of acres protected.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Private Landowners

Locations:

Other species likely to benefit from this action: Spinycheek Crayfish

Season: Year-round

Threat Category: Droughts **Threat Impact:** High - Low

Specific Threat: Habitat degradation due to severe droughts.

Action Category: Manage non-living habitat components

Specific Action: Work with groundwater withdrawal sources to avoid dewatering habitats supporting Lacunicambarus diogenes populations.

Objective: Reduce groundwater withdrawals in the vicinity of Lacunicambarus diogenes colonies.

Action Priority: 3-Medium **Action Urgency:** Can wait 10 years to initiate **Measure:** Number of Lacunicambarus diogenes colonies protected from habitat dewatering.

Potential Collaborators: Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Lower Delaware, Schuylkill, Crosswicks-Neshaminy

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Low

Specific Threat: Highly variable flows due to severe floods and droughts, altering sediment regimes, changing physical habitats, potentially increasing toxic materials.

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting the species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Stream miles designated as impaired by PA DEP in occupied watersheds.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions

Locations:

Other species likely to benefit from this action: Spinycheek Crayfish

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** High - Low

Specific Threat: Highly variable flows due to severe floods and droughts, altering sediment regimes, changing physical habitats, potentially increasing toxic materials.

Action Category: Manage non-living habitat components

Specific Action: Partner with willing landowners to stabilize streambanks, minimize erosion, and avoid excessive impervious surface runoff.

Objective: Protect and enhance water quality in watersheds supporting this species.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Stream miles designated as impaired by PA DEP in occupied watersheds.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC8 Watershed: Lower Delaware, Crosswicks-Neshaminy, Schuylkill

Other species likely to benefit from this action: Faxonius limosus and Cambarus bartonii

Season: Year-round

Priority	Need	Partners
1	Determine method to eliminate or greatly reduce populations of invasive crayfishes at sites with Lacunicambarus diogenes	Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Determine the impacts of anthropogenic factors on populations of Lacunicambarus diogenes and develop methods to eliminate or lesson those impacts.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Although intensive surveys targeting Lacunicambarus diogenes in Pennsylvania were conducted in 2021-2022 (Graham et al. 2023), additional surveys within and adjacent to the known range of the species in the state are warranted, especially on private lands not accessible during the 2021-2022 surveys.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Monitoring of Lacunicambarus diogenes and invasive crayfishes at sites known to harbor L. diogenes

Lead(s) : PFBC

Link: N/A

Description: Periodic monitoring of Lacunicambarus diogenes and invasive crayfishes at sites known to harbor L. diogenes

Monitoring Need: The monitoring is done to ensure that L. diogenes is not declining across its range in Pennsylvania

Bouchard RW, Lieb DA, Carline RF, Nuttall TR, Wengert CB, Wallace JR. 2007. 101 Years of change (1906 to 2007). The distribution of the crayfishes of Pennsylvania. Part I. Eastern Pennsylvania. Academy of Natural Sciences of Philadelphia, Report No. 07–11, Philadelphia, Pennsylvania.

Glon MG, Mularo AJ, Lieb DA, Loughman ZJ. 2018. Rediscovery of Cambarus diogenes (Devil Crayfish) in Pennsylvania. Northeastern Naturalist 25: 355–361.

Graham, Z.A., D.A. Lieb, K.M. Diehl, J. Krochmal, Z.J. Loughman. 2023. The Status and Distribution of The Devil Crayfish, Lacunicambarus diogenes, in Pennsylvania. Final Report for Grant Agreement WRCP-20622. Submitted to The Pennsylvania Department of Conservation & Natural Resources Wild Resource Conservation Program, Harrisburg, Pennsylvania. 55 pp.

Ortmann AE. 1906. The crawfishes of the state of Pennsylvania. Memoirs of the Carnegie Museum 2: 343–523.

PENNSYLVANIA WILDLIFE ACTION PLAN

Northern Clearwater Crayfish

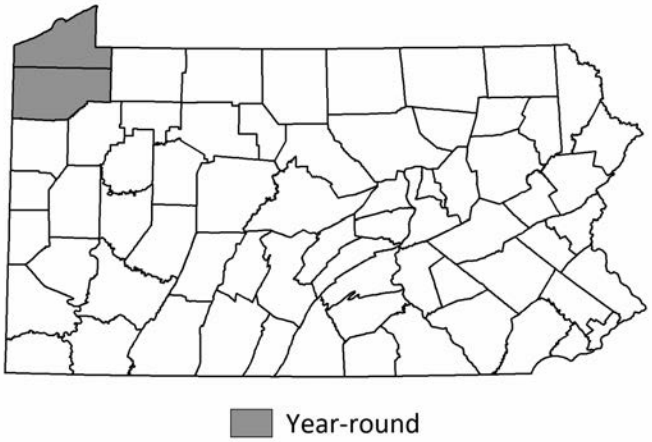
Faxonius propinquus

David A. Lieb ***PA Fish & Boat Commission / Western PA Conservancy***



Z. Loughman, West Liberty University

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations and range

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Most abundant in streams with good habitat and water quality.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish congeners (e.g., Faxonius rusticus).

Action Category: Outreach, communication and distribution

Specific Action: Implement a multi-media public outreach campaign on natural resource harms posed by invasive crayfish.

Objective: Inform the public on natural resource harms posed by invasive crayfish.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of people reached.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Universities & research institutions

Locations: HUC6 Watershed: S. Lake Erie, E. Lake Erie, U. Susquehanna, U. Delaware

Other species likely to benefit from this action: All other native crayfish; native amphibians

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish congeners (e.g., Faxonius rusticus).

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Compile and assess available data to determine if the species should be listed as threatened or endangered in Pennsylvania.

Objective: Determine if the species should be listed as threatened or endangered in Pennsylvania.

Action Priority: 2-High **Action Urgency:** Initiate within 5-10 years **Measure:**

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: HUC6 Watershed: S. Lake Erie, E. Lake Erie, U. Susquehanna, U. Delaware

Other species likely to benefit from this action: Cambarus robustus

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Non-native crayfish congeners (e.g., Faxonius rusticus).

Action Category: Conservation funding

Specific Action: Secure funding to implement conservation initiatives.

Objective: Secure funding to implement one priority conservation initiative every 5 years.

Action Priority: 2-High **Action Urgency:** Initiate within 5-10 years **Measure:** Number of priority conservation initiatives completed.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Locations: HUC6 Watershed: E. Lake Erie, S. Lake Erie, U. Susquehanna, U. Delaware

Other species likely to benefit from this action: Native surface-dwelling crayfishes

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** High - Low

Specific Threat: Loss or degradation of habitats due to agricultural and forestry effluents.

Action Category: Manage non-living habitat components

Specific Action: Work with farmers, facility managers, townships, foresters, lumber and agricultural industry, and other entities to reduce agricultural and forestry effluents discharged into drainages occupied by this species.

Objective: Within 10 years, reduce agricultural and forestry effluents discharged into drainages with Faxonius propinquus.

Action Priority: 3-Medium **Action Urgency:** Can wait 10 years to initiate **Measure:** Miles of unimpaired streams as determined by PA DEP.

Potential Collaborators: Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC6 Watershed: S. Lake Erie, E. Lake Erie, U. Susquehanna, U. Delaware

Other species likely to benefit from this action: Cambarus robustus

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** High - Low

Specific Threat: Pollution (e.g., chlorine, ammonia, nutrients) from treated effluents, combine sewer-stormwater overflows, temperature alterations.

Action Category: Manage non-living habitat components

Specific Action: Work with facility managers, townships, developers, and other entities to reduce domestic and urban wastewater discharged into drainages occupied by this species.

Objective: Within 10 years, reduce concentration of domestic and urban wastewater discharged into drainages with Faxonius propinquus.

Action Priority: 3-Medium **Action Urgency:** Can wait 10 years to initiate **Measure:** Miles of unimpaired streams as determined by PA DEP.

Potential Collaborators: Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC6 Watershed: S. Lake Erie, E. Lake Erie, U. Susquehanna, U. Delaware

Other species likely to benefit from this action: Cambarus robustus

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Low

Specific Threat: Loss or degradation of habitats due to industrial and military effluents.

Action Category: Manage non-living habitat components

Specific Action: Work with facility managers, townships, developers, and other entities to reduce industrial wastewater discharged into drainages occupied by this species.

Objective: Within 10 years, reduce concentration of industrial effluent discharged into drainages with Faxonius propinquus.

Action Priority: 3-Medium **Action Urgency:** Can wait 10 years to initiate **Measure:** Miles of unimpaired streams as determined by PA DEP.

Potential Collaborators: Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC6 Watershed: S. Lake Erie, E. Lake Erie, U. Susquehanna, U. Delaware

Other species likely to benefit from this action: Cambarus robustus

Season: Year-round

Priority	Need	Partners
1	Determine if populations of Faxonius propinquus in the Susquehanna drainage are native or introduced.	Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Determine why invasive crayfishes have not invaded streams in the Lake Erie basin of Pennsylvania (many of which support populations of Faxonius propinquus) despite their presence (Faxonius rusticus) in Lake Erie.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Determine if Faxonius propinquus occurs in any drainages in PA from which it is currently not known	Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Within watersheds in Pennsylvania where Faxonius propinquus occurs, sample stream reaches that have not yet been surveyed	Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Monitor known populations of Faxonius propinquus across its range in Pennsylvania

Lead(s) :

Link: N/A

Description: Measure abundance of Faxonius propinquus periodically (e.g. every 1-5 years) at sites in both drainages in Pennsylvania where Faxonius propinquus occurs (Erie and Susquehanna). Methods utilized in the most recent survey of western PA crayfishes (10 seine hauls per site) can be repeated at known sites (Loughman et al. 2020).

Monitoring Need: The monitoring is done to ensure that F. propinquus is not declining across its range in Pennsylvania.

Bouchard RW, Lieb DA, Carline RF, Nuttall TR, Wengert CB, Wallace JR. 2007. 101 Years of change (1906 to 2007). The distribution of the crayfishes of Pennsylvania. Part I. Eastern Pennsylvania. Academy of Natural Sciences of Philadelphia, Report No. 07–11, Philadelphia, Pennsylvania.

Loughman ZJ, Lieb DA, Sykes AM, Khan TN, Allison PF Jr. 2020. Western Pennsylvania crayfish inventory and conservation assessment. Harrisburg, PA: Final Report submitted to the Pennsylvania Fish and Boat Commission. i–396.

Ortmann AE. 1906. The crawfishes of the state of Pennsylvania. Memoirs of the Carnegie Museum 2: 343–523.

PENNSYLVANIA WILDLIFE ACTION PLAN

Calico Crayfish

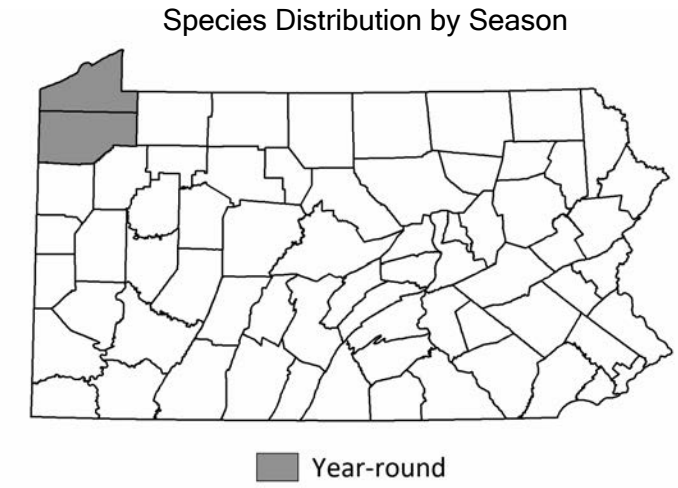
Faxonius immunis

David A. Lieb

PA Fish & Boat Commission / Western PA Conservancy



J. Sartore, West Liberty University



Conservation Profile

PA 10-Year Conservation Goal: Maintain exiting populations and prevent losses resulting from invasive crayfish introductions, habitat loss and degradation, and other anthropogenic impacts

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: In Pennsylvania, Faxonius immunis occurs primarily in roadside ditches with permanent or near permanent standing water and abundant vegetation, although the species also occurs in Presque Isle Bay (Lake Erie) and also in ponds in Presque Isle State Park and elsewhere.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Warm, Headwaters and Creeks

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Very High - Medium

Specific Threat: Degraded habitats (e.g., ditches, wetlands, seeps) adjacent to roadways due to contaminants (e.g., deicing materials, pesticides, nutrients, heavy metals)

Action Category: Manage non-living habitat components

Specific Action: Reduce use of herbicides, insecticides, biocides, road salts, and other toxic chemicals along roadways, associated ditches, and adjacent habitats and avoid habitat alteration of any kind in those habitats.

Objective: Maintain and improve populations of this species in habitats along roadways.

Action Priority: 2-High

Action Urgency: Can wait 10 years to initiate

Measure: Number of F. immunis populations protected.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Geological Survey

Locations: HUC6 Watershed: E. Lake Erie, S. Lake Erie, Allegheny

Other species likely to benefit from this action: Creaserinus fodiens

Season: Year-round

Priority	Need	Partners
1	Use genetic techniques to determine the status (native or introduced) of each population of Faxonius immunis that occurs in Pennsylvania.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Determine if Faxonius immunis occurs in any drainages in PA from which it is currently not known	Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Within watersheds in Pennsylvania where Faxonius immunis occurs, survey locations, especially roadside ditches with standing water, that have not yet been surveyed	Universities & research institutions, Pennsylvania Fish and Boat Commission

Name: Monitor known populations of Faxonius immunis across its range in Pennsylvania **Lead(s) :** PFBC

Link: N/A

Description: Measure abundance of Faxonius immunis periodically (e.g. every 1-5 years) at sites in both drainages in Pennsylvania where Faxonius immunis occurs (Erie and Ohio). Methods utilized in the most recent surveys of western PA crayfishes (trapping and/or 10 seine hauls per site) can be repeated at known sites (Khan et al. 2020, Loughman et al. 2020).

Monitoring Need: The monitoring is done to ensure that F. immunis is not declining across its range in Pennsylvania.

Bouchard RW, Lieb DA, Carline RF, Nuttall TR, Wengert CB, Wallace JR. 2007. 101 Years of change (1906 to 2007). The distribution of the crayfishes of Pennsylvania. Part I. Eastern Pennsylvania. Academy of Natural Sciences of Philadelphia, Report No. 07–11, Philadelphia, Pennsylvania.

Khan, T.N., Lieb, D.A. and Loughman, Z.L. 2020. Distribution and conservation status of the digger crayfish (Creaserinus fodiens, Cottle 1863) in Pennsylvania. Final Report submitted to the Pennsylvania Wild Resource Conservation Program. Department of Conservation and Natural Resources. Harrisburg, PA., 1–85 pp.

Kormondy, E.J. 1969. Comparative ecology of sandspit ponds. American Midland Naturalist 82: 28-61.

Loughman ZJ, Lieb DA, Sykes AM, Khan TN, Allison PF Jr. 2020. Western Pennsylvania crayfish inventory and conservation assessment. Harrisburg, PA: Final Report submitted to the Pennsylvania Fish and Boat Commission. i–396.

PENNSYLVANIA WILDLIFE ACTION PLAN

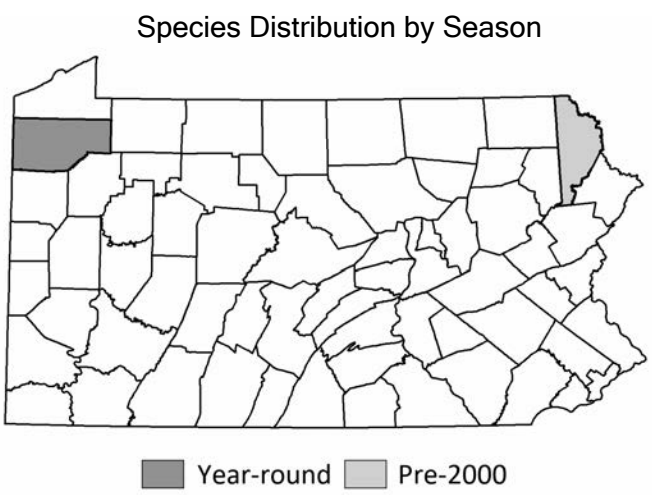
Feminine Clam Shrimp

Cyzicus gynecia

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain the known populations, and improve our knowledge of its distribution within Pennsylvania.

NatureServe Global Rank: G2Q

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: This species can use shallower vernal pools than many vernal pool obligates, such a "tire-rut pools" on disused dirt roads.

Primary Habitat: Palustrine

Primary Habitat Type: Vernal Pools/Ephemeral Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: "Tire rut pools" are a major habitat for this species. Moderate road use during the active season, or road improvement in any season, could destroy a population. Light usage of dirt roads probably creates habitat.

Action Category: Manage non-living habitat components

Specific Action: At known sites, avoid road surface improvements such as adding gravel, and avoid using these roads for projects that will involve heavy traffic.

Objective: Work with landowners to avoid impact to occupied "tire-rut" dirt road habitats.

Action Priority:

Action Urgency: Initiate within 5 years

Measure: number of sites with landowner agreements

Potential Collaborators: Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus

Other species likely to benefit from this action: Mountain chorus frogs also use similar tire-rut habitat, but they are unlikely to be present at the same site.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

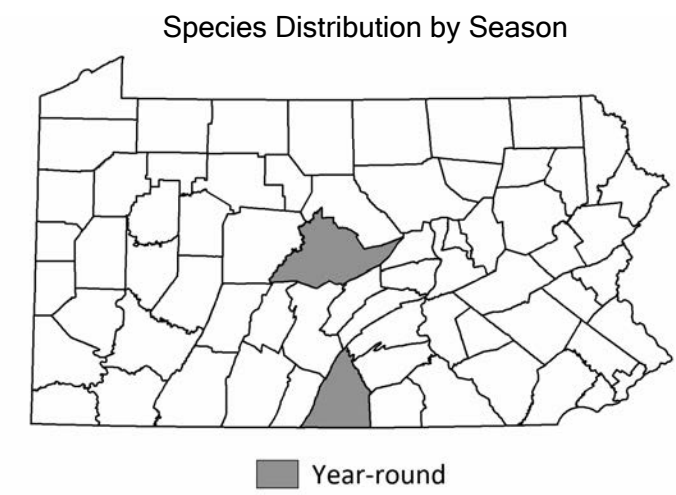
Eastern Fairy Shrimp

Eubranchipus holmanii

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain the known population, and improve our knowledge of its distribution within Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: vernal pools

Primary Habitat: Palustrine

Primary Habitat Type: Vernal Pools/Ephemeral Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Development of any kind can destroy or degrade vernal pool habitat.

Action Category: Conservation planning

Specific Action: Promote vernal pool conservation strategies

Objective: Encourage implementation of existing vernal pool BMPs on private lands.

Action Priority: **Action Urgency:** Initiate within 5-10 years **Measure:** number of management plans

Potential Collaborators: Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Feminine Clam Shrimp (Cyzicus gynecia) Jefferson Salamander (Ambystoma jeffersonianum) Marbled Salamander (Ambystoma opacum) fairy shrimp (Eubranchipus spp.) Wood Frog (Lithobates sylvaticus) Effectiveness Monitoring

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Development of any kind can destroy or degrade vernal pool habitat.

Action Category: Conservation planning

Specific Action: Promote vernal pool conservation strategies.

Objective: Encourage implementation of existing vernal pool BMPs on private lands.

Action Priority: **Action Urgency:** Initiate within 5 years **Measure:** Number of management plans

Potential Collaborators: Private Landowners

Locations: Physiographic Province: Ridge and Valley

Other species likely to benefit from this action: Feminine Clam Shrimp (Cyzicus gynecia) Jefferson Salamander (Ambystoma jeffersonianum) Marbled Salamander (Ambystoma opacum) fairy shrimp (Eubranchipus spp.) Wood Frog (Lithobates sylvaticus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

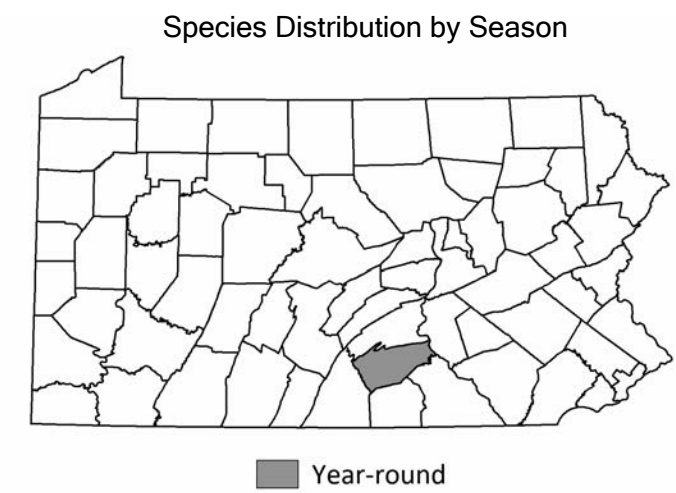
Euroamerican Clam Shrimp

Limnadia lenticularis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain the known population, and improve our knowledge of its distribution within Pennsylvania.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: vernal pools

Primary Habitat: Palustrine

Primary Habitat Type: Vernal Pools/Ephemeral Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Development of any kind can destroy or degrade vernal pool habitat.

Action Category: Conservation planning

Specific Action: Promote vernal pool conservation strategies

Objective: Encourage implementation of existing vernal pool BMPs on private lands.

Action Priority: **Action Urgency:** Initiate within 5-10 years **Measure:** Number of management plans.

Potential Collaborators: Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Jefferson Salamander (Ambystoma jeffersonianum) Marbled Salamander (Ambystoma opacum) fairy shrimp (Eubranchipus spp.) Wood Frog (Lithobates sylvaticus)

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Development of any kind can destroy or degrade vernal pool habitat.

Action Category: Conservation planning

Specific Action: Promote vernal pool conservation strategies.

Objective: Encourage implementation of existing vernal pool BMPs on private lands.

Action Priority: **Action Urgency:** Initiate within 5-10 years **Measure:** Number of management plans.

Potential Collaborators: Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Feminine Clam Shrimp (Cyzicus gynecia) Jefferson Salamander (Ambystoma jeffersonianum) Marbled Salamander (Ambystoma opacum) fairy shrimp (Eubranchipus spp.) Wood Frog (Lithobates sylvaticus)

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys of clam shrimp and fairy shrimp are needed to better understand the distribution of this species in PA.	

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Refton Cave Planarian

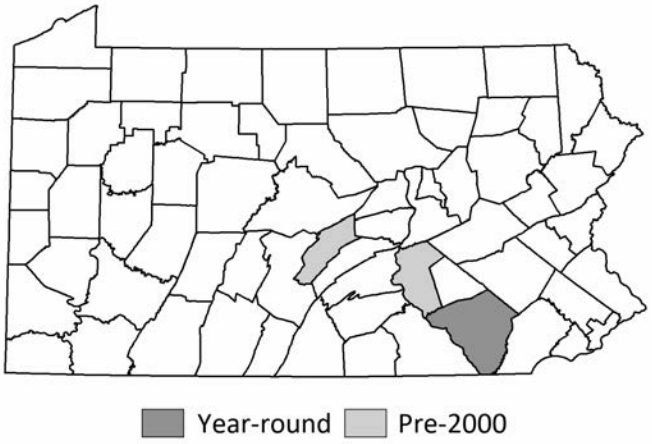
Sphalloplana pricei

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations in Pennsylvania at current levels; maintain protection for ground water and springs within the extent of occupation.

NatureServe Global Rank: G2G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Streams and pools in caves

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Medium - Low

Specific Threat: Limestone (and other minerals) is mined in the area; mining could damage the cave.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: Consider this globally imperiled species for state listing, so that the environmental review process could protect known sites from new limestone mines.

Objective: Perform enough surveys to definitively determine the state legal rank

Action Priority: 3-Medium **Action Urgency:** **Measure:** determination of the state legal rank

Potential Collaborators: Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Ridge and Valley, Piedmont, Piedmont, Piedmont, Ridge and Valley, Ridge and Valley, Ridge and Valley. Physiographic Section: Appalachian Mountain, Piedmont Upland, Piedmont Lowland, Gettysburg-Newark Lowland, Blue Mountain, Anthracite Upland, Susquehanna Lowland

Other species likely to benefit from this action:

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A freshwater sponge

Heteromeyenia longistylus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to determine whether this species still persists here.

NatureServe Global Rank: G1G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents

Threat Impact: High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A freshwater sponge

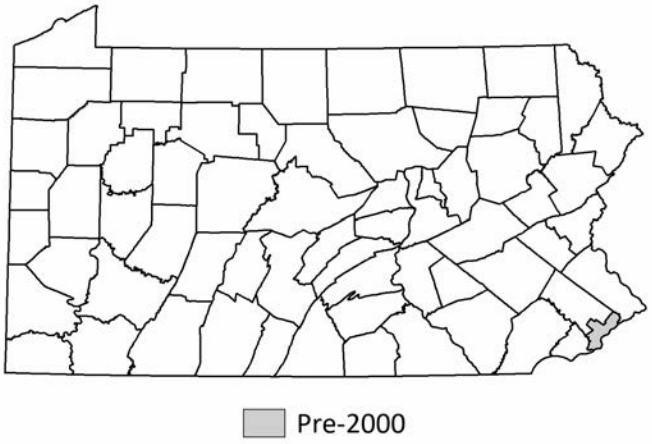
Heteromeyenia tentasperma

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to determine whether this species still persists here.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents

Threat Impact: High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A freshwater sponge

Anheteromeyenia ryderi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to determine whether this species still persists here.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Agricultural and Forestry Effluents

Threat Impact: High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

A freshwater sponge

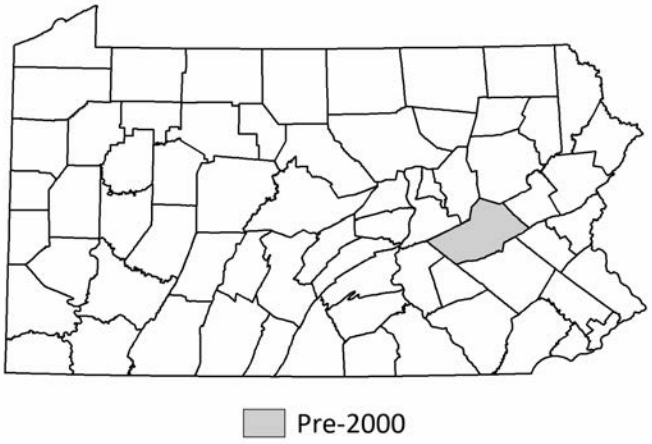
Trochospongilla leidii

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to determine whether this species still persists here.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents

Threat Impact: High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A freshwater sponge

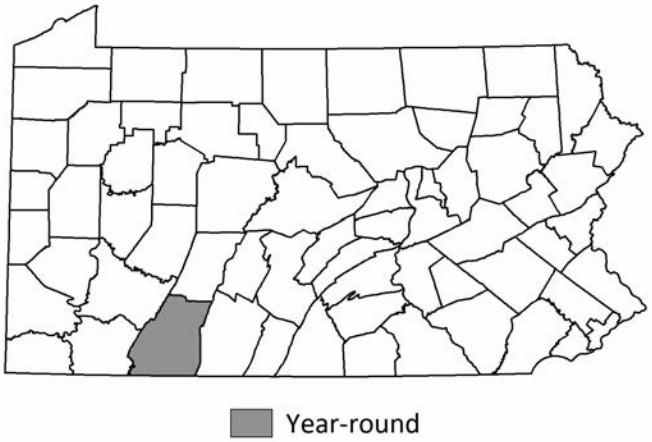
Ephydatia muelleri

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to better understand the distribution of this species.

NatureServe Global Rank: G2G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents

Threat Impact: High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Improve stream water quality and habitats

Potential Collaborators: Pennsylvania Fish and Boat Commission, Pennsylvania Association of Conservation Districts, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A freshwater sponge

Heteromeyenia latitenta

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to determine whether this species still persists here.

NatureServe Global Rank: G3G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents

Threat Impact: High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Urn-shaped Freshwater Sponge

Radiospongilla crateriformis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to determine whether this species still persists here.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

River Rock Freshwater Sponge

Trochospongilla horrida

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to better understand the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pennsylvanian Freshwater Sponge

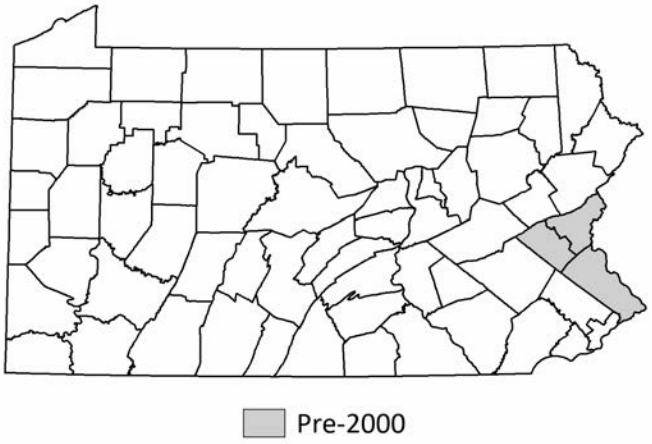
Trochospongilla pennsylvanica

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to determine whether this species still persists here.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Silver-seeded Freshwater Sponge

Anheteromeyenia argyrosperma

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to determine whether this species still persists here.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Unknown

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams potentially inhabited by this species.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Any aquatic SGCN in those streams

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Fragile Freshwater Sponge

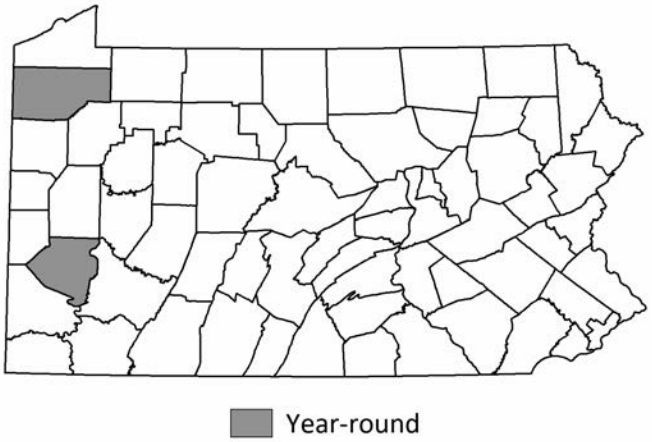
Eunapius fragilis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to better understand the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Bailey's Freshwater Sponge

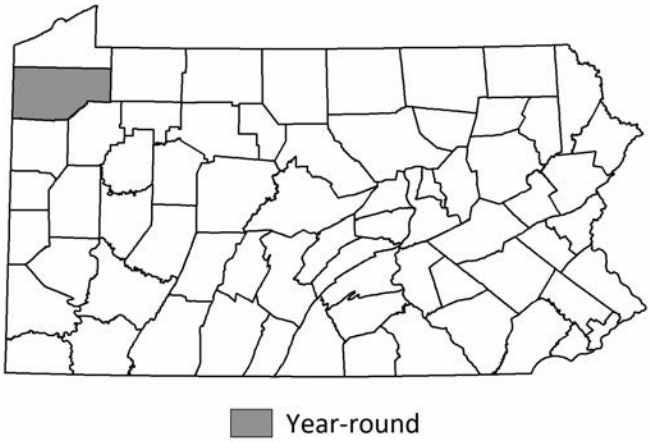
Heteromeyenia baileyi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Continue to inventory freshwater sponges across the state, to better understand the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Requires clear, clean water with hard substrate and minimal silt. Most often found in flowing waters, especially outflows of reservoirs, but there is also potential to find it in reserviors.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** High - Low

Specific Threat: Siltation, nitrates

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Spotted Firefly

Lucidota punctata

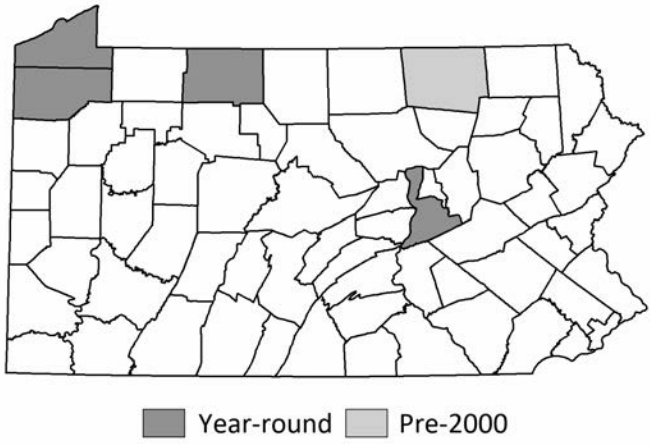
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Z. Dankowicz

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Moist, open mature forest.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Low

Specific Threat: Pesticides applied to forests may impact this species.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Minimize application of pesticides to forests. Use BMPs to guide any pesticide application that does occur is necessary and minimal.

Objective: Use BMPs to guide any pesticide application that does occur is necessary and minimal.

Action Priority: **Action Urgency:** **Measure:** weight of pesticides applied annually to forested state lands.

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: Insects and invertebrates in general

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pennsylvania Cave Beetle

Pseudanophthalmus sp. 44

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the habitat from being mined away.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: The species is only known from Rhodes Cave.

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Very High

Specific Threat: The single site known globally for this species is an active limestone mine. As of 2018, the mine was permitted and the mine operator intended to mine the area, and he estimated the cave would be destroyed within 10-15 years. As of 2024, aerial photos do not show any evidence of recent mining. We are proceeding under the assumption that mining is still a very serious threat.

Action Category: Outreach, communication and distribution

Specific Action: Encourage the publication of the species description.

Objective: Identify taxonomists who could work on this species, and bring the draft manuscript to their attention.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Publication of species description

Potential Collaborators: Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Very High

Specific Threat: The single site known globally for this species is an active limestone mine. As of 2018, the mine was permitted and the mine operator intended to mine the area, and he estimated the cave would be destroyed within 10-15 years. As of 2024, aerial photos do not show any evidence of recent mining. We are proceeding under the assumption that mining is still a very serious threat.

Action Category: Conserve specific land or seascapes

Specific Action: Acquire and preserve Rhodes Cave.

Objective: Acquire and preserve Rhodes Cave.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of caves protected

Potential Collaborators: Conservancies & Land Trusts

Locations: Physiographic Section: Allegheny Mountain

Other species likely to benefit from this action: Big Brown Bat (Eptesicus fuscus) Eastern Red Bat (Lasiurus borealis) A sheetweb cave spider (Bathyphantes weyeri) A sheetweb cave spider (Phanetta subterranea) Appalachian Cave Spider (Porhomma cavernicola)

No known research needs.

Season: Year-round

Priority	Survey	Partners
1	Surveys are needed to (1) determine if the species is still present in the cave, (2) to collect additional specimens of the species, which will help with writing the species description, (3) determine if the species is present in any caves with 5 miles, (4) to determine if undescribed Pseudanopthalmus species are present in other Pennsylvania caves.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Encircled Borer

Agrilus subcinctus

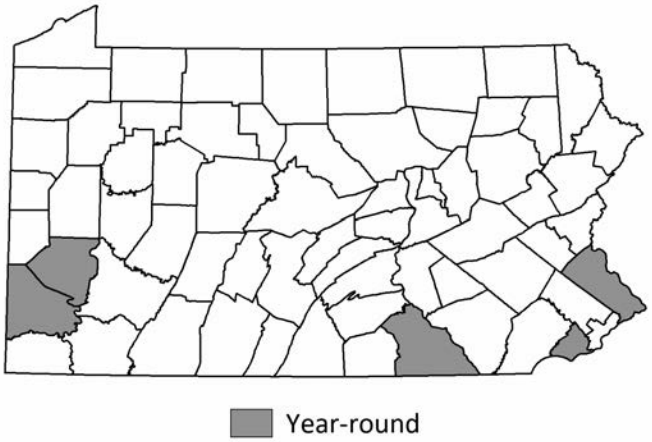
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Butler

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain the presence of the species in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 80-90%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Uses green ash (Fraxinus pennsylvanica), and possibly other Fraxinus spp. Reported to use privet (Ligustrum).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. Ash saplings are being killed by EAB as they mature, so there is a low and steady supply of dead ash twigs that might be used by A. subcinctus, but eventually this supply will dry up. There is a possibility that the species will persist on Ligustrum.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Charlie Brown Flea Beetle

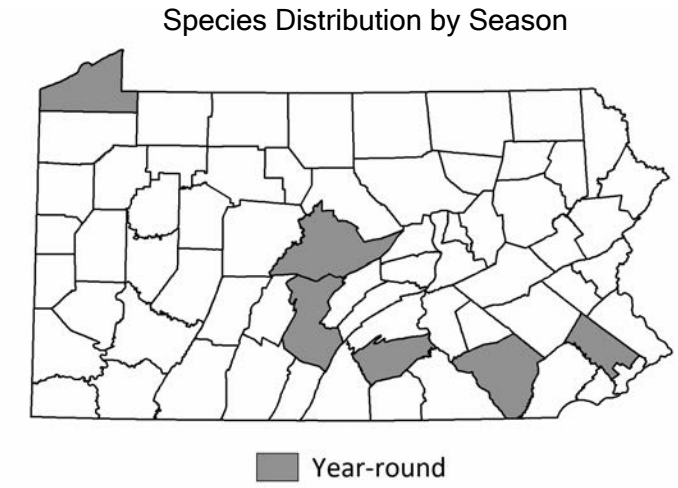
Capraita sexmaculata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Gruver



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-80%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Uses ash trees (Fraxinus spp.) and fringetree (Chionanthus virginicus).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, presumably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Eastern Ash Bark Beetle

Hylesinus aculeatus

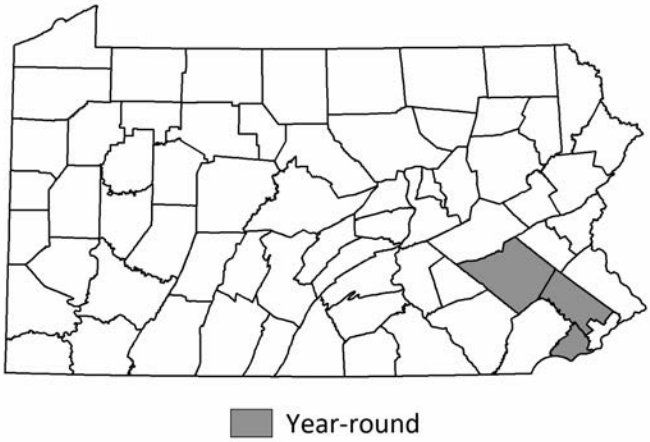
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Cappaert

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species from Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >80%

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Uses white ash (Fraxinus americana) and green ash (Fraxinus pennsylvanica), and possibly other ash species.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Insecticide-free mature trees are virtually gone from PA, and smaller trees will become rare in coming years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

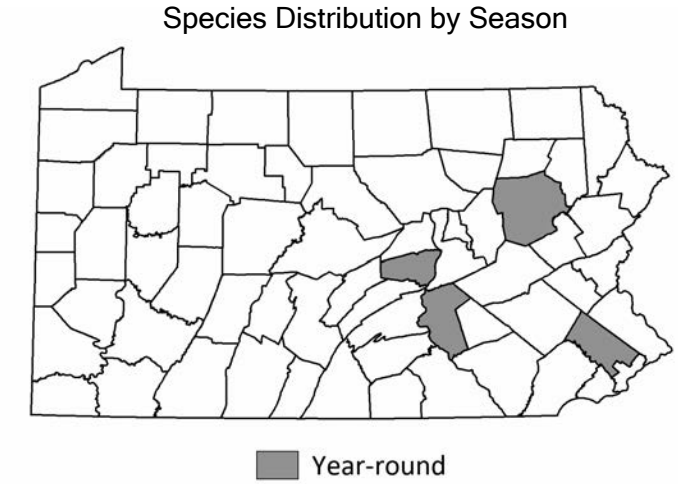
An ash bark beetle

Hylesinus criddlei

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



J. Mercado



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >80%

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Uses white ash (Fraxinus americana) and green ash (F. pennsylvanica), and possibly other ashes.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Insecticide-free mature trees are virtually gone from PA, and smaller trees will become rare in coming years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

White-banded Ash Bark Beetle

Hylesinus fasciatus

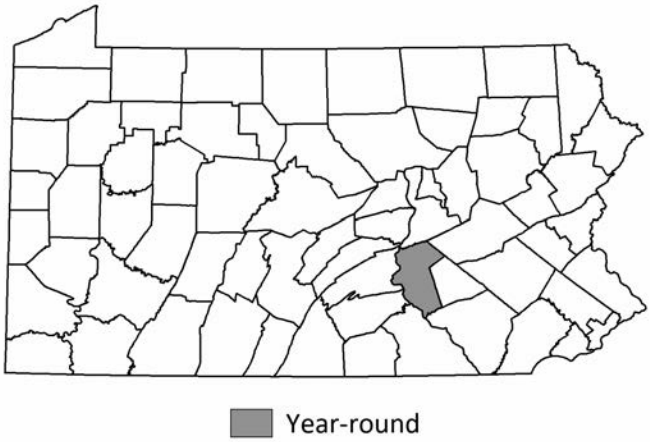
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Bloin

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of this species from Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >80%

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Uses white ash (Fraxinus americana).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Insecticide-free mature trees are virtually gone from PA, and smaller trees will become rare in coming years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An ash seed weevil

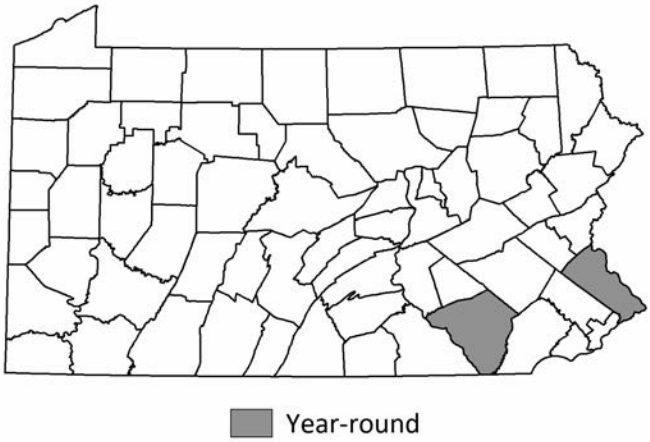
Lignyodes bischoffi

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



B. Gruver

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species from Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >90%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: mature ash trees; forest

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: This seed-eating beetle needs mature ash trees, which have nearly all been killed by EAB. It may possibly be persisting on Syringa seeds.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

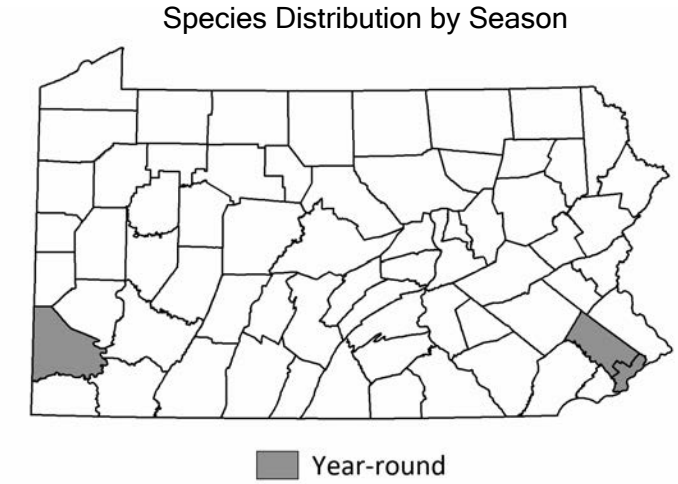
An ash seed weevil

Lignyodes fraxini

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



T. Murray



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of this species from Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >90%

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: mature ash trees; forest

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Mature (seed-producing) ash trees not treated with insecticide are nearly gone in PA, and are not expected to recover any time soon. But if these beetles are persisting on Syringa seeds, they are not as threatened.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An ash seed weevil

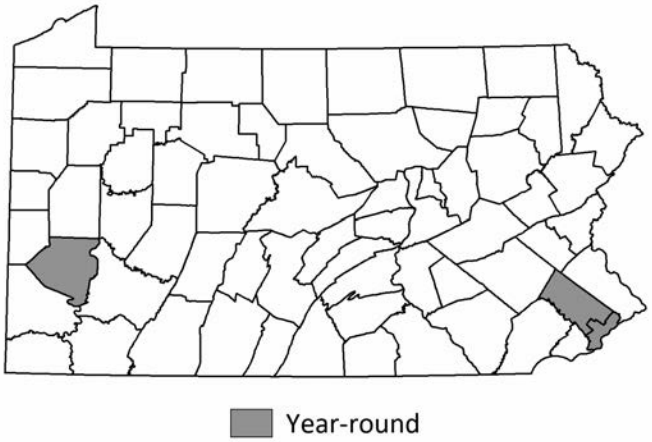
Lignyodes helvolus

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



J. F

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species from Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >90%

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: mature ash trees; forest

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Mature (seed-producing) ash trees not treated with insecticide are nearly gone in PA, and are not expected to recover any time soon. But if these beetles are persisting on Syringa seeds, they are not as threatened.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

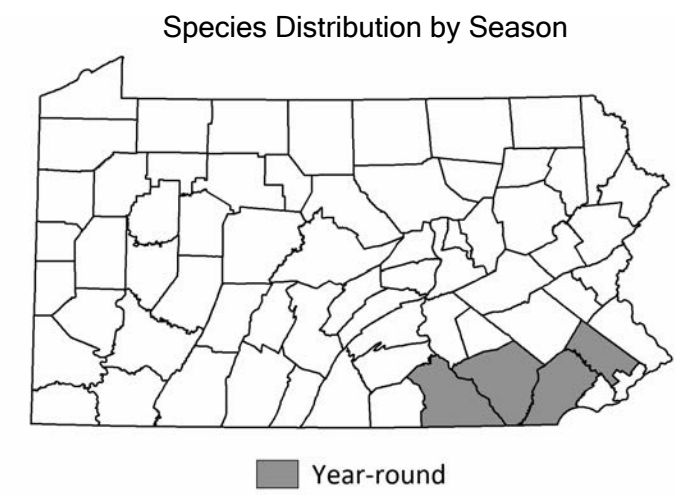
Lesser Chestnut Weevil

Curculio sayi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain populations in Pennsylvania through 2035.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: This beetle is a specialist on chestnuts (Castanea spp.), including American chestnut (Castanea dentata), Allegheny chinquapin (Castanea pumila), and Chinese chestnut (Castanea mollisima). Larvae develop inside the nuts.

Primary Habitat: Forested Upland

Primary Habitat Type: Agriculture: Plantations/Orchards

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - Medium

Specific Threat: Loss of American chestnut trees due to chestnut blight.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant blight-resistant American chestnuts when they are available.

Objective: Depends on availability of blight-resistant trees.

Action Priority: 3-Medium

Action Urgency:

Measure: Number of trees planted; number of sites with trees.

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: Rehn's Miner Bee (Andrena rehni) Allegheny Woodrat (Neotoma magister)

No known research needs.

Season: Year-round

Priority	Survey	Partners
5	Surveys at sites with chinquapin and Chinese chestnut are warranted to determine the current distribution of this beetle in Pennsylvania.	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Goat's Rue Leafminer

Odontota notata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Stovall

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this beetle is still present in Pennsylvania, and determine whether the host plant needs state protection.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: The sole host plant of this leaf-mining beetle is goat's-rue (Tephrosia virginica). The plant grows in open woodland habitats and edges, in rocky to sandy soil, in the southeastern third of Pennsylvania.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Fire suppression leads to succession of woody plants in the woodland habitat where Tephrosia virginana grows (Mohr, 2013. Virginia Goat's Rue Recovery Strategy in Ontario)

Action Category: Manage non-living habitat components

Specific Action: When conducting prescribed burns on state lands, identify stands of Goat's Rue (Tephrosia virginiana) within the project area, and incorporate them into the project planning.

Objective: Conduct the burning in patches to ensure that no more than 25% of the Goat's Rue plants are disturbed by any one round of disturbance, and allow several years for recovery before additional patches of the plant are disturbed.

Action Priority: 3-Medium

Action Urgency: Initiate immediately

Measure: Number of burn projects containing Goat's Rue. Percent of Goat's Rue plants burned by each of those projects.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: Goat's Rue (Tephrosia virginiana)

No known research needs.

Season: Year-round

Priority	Survey	Partners
4	Surveys are needed to determine whether this beetle still occurs in Pennsylvania. When Tephrosia virginiana is seen, leafminers should be looked for. If leafmines are seen, collect several active ones if the population is large enough to allow it, and rear to maturity to identify the species.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

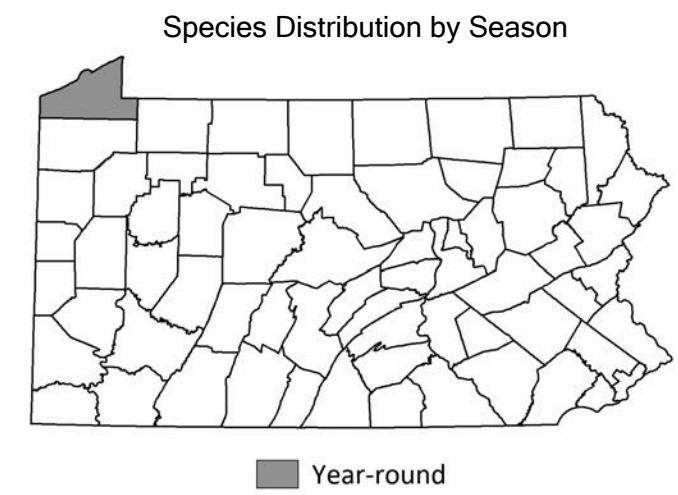
A click beetle

Paracardiophorus cardisce

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



J. A



Conservation Profile

PA 10-Year Conservation Goal: Maintain the population at Presque Isle, and improve our knowledge of its distribution within the park.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Within Pennsylvania, this beetle is known only from Presque Isle. It relies on deep sand habitats, and can be found on Great Lakes beaches under debris at the high water line, and in dune vegetation.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Beaches & Dunes

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Recreational Activities **Threat Impact:** Low

Specific Threat: Effects of foot traffic, increasing over time, are uncertain but probably not catastrophic over the next ten years.

Action Category: Other legal actions

Specific Action: Maintain policies of keeping people off Piping Plover habitat (ie, Gull Point) during the breeding season. This will protect other sand barren specialist species that are vulnerable to foot traffic.

Objective: Minimize effects of foot traffic on most parts of Gull Point.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Occupancy of various segments of beach

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys are needed to determine the distribution of this species within Presque Isle.	Pennsylvania Department of Conservation and Natural Resources

No known monitoring programs.

References

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Frosty Bark Weevil

Hylesinus pruinosus

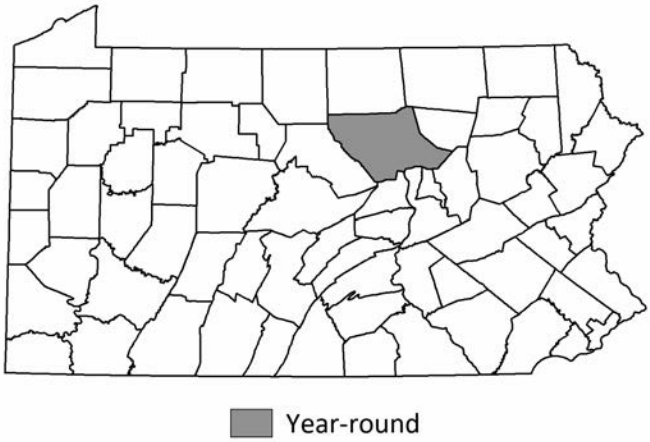
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



E. Vallery

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species from Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >80%

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Uses white ash (Fraxinus americana).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Insecticide-free mature trees are virtually gone from PA, and smaller trees will become rare in coming years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Eastern Hercules Beetle

Dynastes tityus

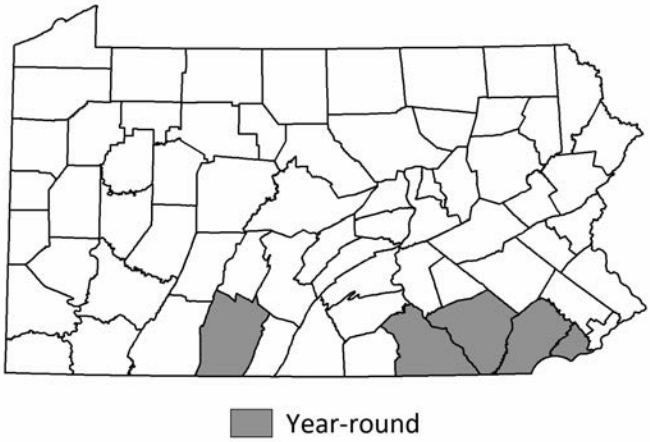
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



eaamico

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species in Pennsylvania. Determine to degree to which ashes (Fraxinus spp.) are critical to this beetle, and what age classes of tree are used.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Larvae require large trees, almost always oaks (Quercus spp.) with rot holes in trunk. Adults apparently require ash trees (Fraxinus spp.) for feeding and mating.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Habitat Comments: The size class of used ash trees is not known. The proximity of the adult habitat (ash trees) to the larval habitat (large oak trees) is not known.

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. Adults require ash trees for feeding (and possibly mating), but it is not clear if ash saplings are meeting that need. If food trees fail, there will be a lag of several years before the next generation of beetles fails to emerge.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Physiographic Province: Piedmont

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Eastern Ironclad Beetle

Phellopsis obcordata

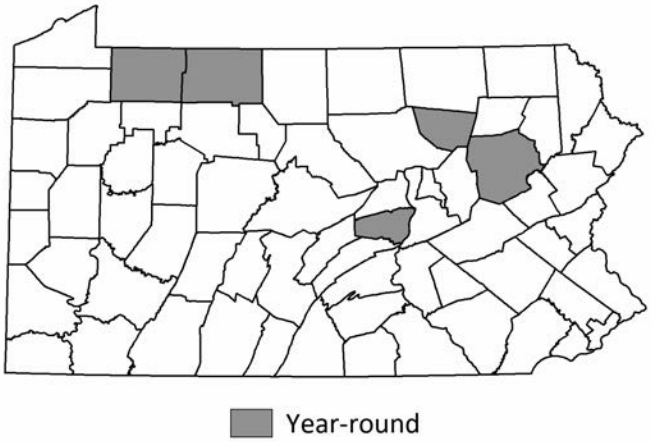
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Hill

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain currently know populations through 2035, and continue to search for new populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: These beetles live on polypore mushrooms. High densities and volumes of live and dead trees are needed to generate high densities of polypore fungi over time. Many mature forests that would appear to provide habitat are usually unoccupied, because this beetle is flightless and generally cannot recolonize a recovered habitat unless there is an immediately adjacent source population.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Logging and Wood Harvesting

Threat Impact: Medium - Low

Specific Threat: The Eastern Ironclad Beetle lives in older-growth to old-growth forests. Timber management results in a greatly reduced density of the polypore fungi that this beetle relies on. Fragmentation of older forests is another threat, preventing recolonization or genetic exchange because this flightless beetle cannot disperse across large gaps in older forest.

Action Category: Conserve specific land or seascapes

Specific Action: For each known population, identify mature forest habitat surrounding the occurrence and work with land managers to prevent logging and manage the area as a mature/old-growth stand.

Objective: Ensure no-timbering management at all known occurrences (5 as of this writing)

Action Priority:

Action Urgency: Initiate within 5 years

Measure: number of occurrences protected by no-timber management.

Potential Collaborators: Other federal agency, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - Medium

Specific Threat: Eastern Hemlock and American Beech are the most dominant trees in Pennsylvania's old- and older-growth forests. Hemlocks are being heavily impacted by Hemlock Woolly Adelgid, and beeches are declining from a combination of Beech Bark Disease and Beach Leaf Disease.

Action Category: Basic research and status monitoring

Specific Action: Continue research into methods to combat the spread of, or the mortality associated with, hemlock woolly adelgid and beach leaf disease. Implement methods when they are found to be effective.

Objective: Depends on the findings of ongoing research

Action Priority: 1-Highest

Action Urgency:

Measure: survival of hemlock and beech trees in areas that support eastern ironclad beetles.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, U.S. Forest Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: a variety of birds, moths, and other species that use hemlocks and beeches as habitat.

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Unknown

Specific Threat: Using insecticides to save old hemlock trees from Hemlock Woolly Adelgid may have non-target effects on forest insects. If pesticides can be transferred into polypore fungi on the trees, they could be killing the Eastern Ironclad Beetle and a variety of other fungus-dependent insects.

Action Category: Basic research and status monitoring

Specific Action: Determine whether insecticides used on hemlock woolly adelgids are present in polypore fungi on those hemlocks, and if they pose a threat to insects using those fungi.

Objective: Do an experiment to determine whether insecticides for HWA move into fungi and fungi-associated insects.

Action Priority: 4-Low **Action Urgency:** Initiate within 5-10 years **Measure:** Determining the answer to the question.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action:

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Mature forests throughout the state should be surveyed for this beetle.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Eight-spotted Flower Longhorn Beetle

Typocerus octonotatus

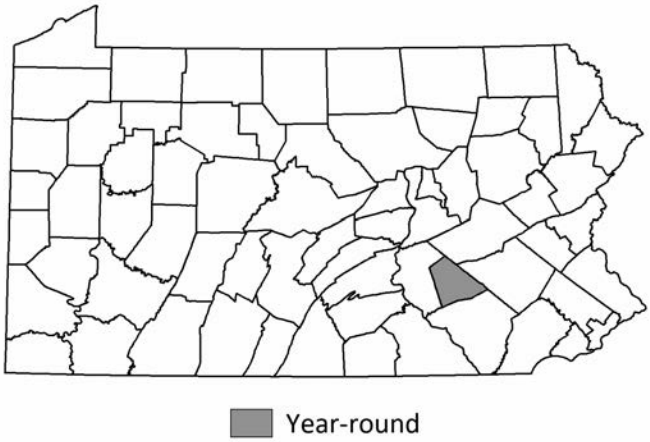
Pete Woods, Robert Androw

Western Pennsylvania Conservancy, PA Natural Heritage Program; Carnegie Museum of Natural History



S. Mlodinow

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain or expand the current population level through 2035

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Farther west, this is a prairie species. The habitat at Fort Indiantown Gap provides open enough conditions for this species, though its precise habitat requirements are not known.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Succession of meadows to woodland or forest would exclude this species.

Action Category: Manage non-living habitat components

Specific Action: Incorporate this species into the management plan for Fort Indiantown Gap, and maintain the current disturbance regime.

Objective: Identify management practices that would maintain the population, and incorporate them into the management plan.

Action Priority: 4-Low **Action Urgency:** Initiate within 5-10 years **Measure:** Updated management plan

Potential Collaborators:

Locations: Physiographic Section: Great Valley, Blue Mountain

Other species likely to benefit from this action:

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Tompkins County Harp Ground Beetle

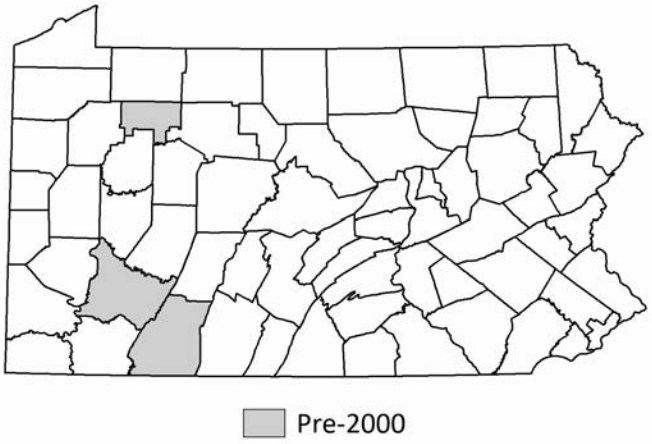
Platynus indecentis

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



T. Hernandez

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations, and improve our knowledge of the distribution of this species in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: sphagnum bogs

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Medium - Low

Specific Threat: Nitrogen-rich runoff from farms degrades sphagnum bog habitats.

Action Category: Conserve via zoning or informal designations

Specific Action: Engage adjacent landowners to establish voluntary agreements for vegetated buffers between crop fields/pastures and peatlands.

Objective: Identify and contact at least 20 landowners around insufficiently buffered peatlands to voluntarily establish vegetated buffers; provide technical assistance.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of landowner contacts; Number of buffers expanded.

Potential Collaborators: Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus. Physiographic Section: Northwestern Glaciated Plateau, Glaciated Low Plateau

Other species likely to benefit from this action: Darlington's Harp Ground Beetle (Agonum darlintoni), Elfin Skimmer (Nannothemis bella), Bog Copper (Tharsalea epixanthe), Epauletted Pitcher Plant Moth (Exyra fax), Small Brocade Moth (Oligia minuscula)

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** Medium - Low

Specific Threat: Nitrogen-rich seepage from septic systems degrades sphagnum bog habitats.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement.

Objective: Work with willing landowners to protect priority bog sites.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Appalachian Plateaus. Physiographic Section: Northwestern Glaciated Plateau, High Plateau, Deep Valleys, Glaciated Low Plateau, Glaciated High Plateau, Glaciated High Plateau, Anthracite Valley, Glaciated Pocono Plateau

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris) Darlington's Harp Ground Beetle (Agonum darlingtoni)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

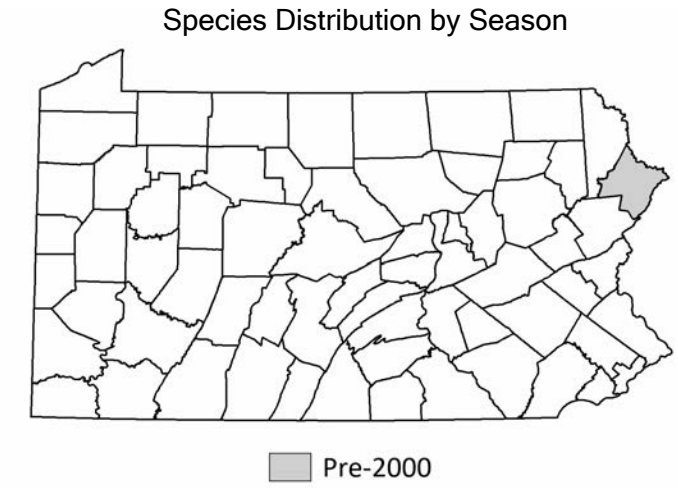
Darlington's Harp Ground Beetle

Agonum darlingtoni

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the distribution of this species by surveying beetles in bogs across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: sphagnum bogs

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Medium - Low

Specific Threat: Nitrogen-rich runoff from farms degrades sphagnum bog habitats.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement.

Objective: Work with willing landowners to put protections in place

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts, Private Landowners

Locations: Physiographic Section: Northwestern Glaciated Plateau, High Plateau, Deep Valleys, Glaciated High Plateau, Glaciated High Plateau, Glaciated Low Plateau, Glaciated High Plateau, Glaciated Low Plateau, Anthracite Valley, Glaciated Pocono Plateau

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris)

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** Medium - Low

Specific Threat: Nitrogen-rich seepage from septic systems degrades sphagnum bog habitats.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement.

Objective: Work with willing landowners to put protections in place

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts, Private Landowners

Locations: Physiographic Section: Northwestern Glaciated Plateau, High Plateau, Deep Valleys, Glaciated Low Plateau, Glaciated High Plateau, Anthracite Valley, Glaciated Pocono Plateau

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Appalachian Tiger Beetle

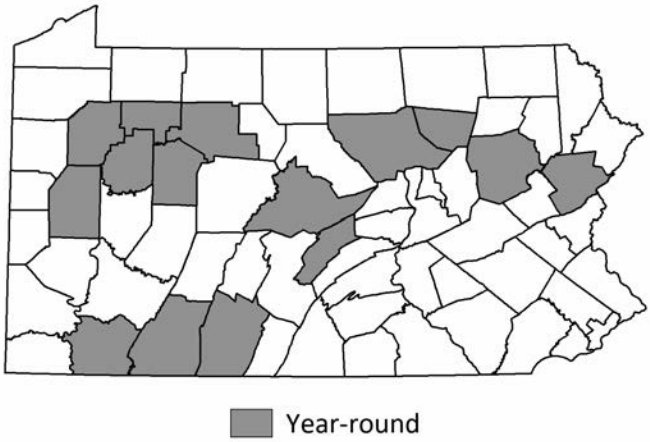
Cicindela ancocisconensis

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain populations at current levels through 2035

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Sparsely vegetated sand or loam deposits on the floodplains of large creeks to large rivers.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Medium - Low

Specific Threat: Dams suppress the flooding regimes that create riparian sand deposits.

Action Category: Manage non-living habitat components

Specific Action: Work with dam operators on rivers occupied by Appalachian tiger beetles to provide seasonal pulses of water that help create and maintain habitat.

Objective: Work with operators of the dams at Youghiogheny River Lake to incorporate management for the tiger beetle into their operations.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** area of sand patches along selected stretches of river.

Potential Collaborators: Other federal agency

Locations: HUC10 Watershed: Mid. Youghiogheny R., U. Youghiogheny R., Laurel Hill Cr.

Other species likely to benefit from this action: stiff cowbane (Oxypolis rigidior)

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Stilt grass (Microstegium vimineum) and knotweed (Fallopia spp.) make open riparian habitats unsuitable.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Manage stilt grass and knotweed on river stretches that support the Appalachian tiger beetle.

Objective: Establish riparian weed control programs on five rivers that support the Appalachian tiger beetle

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** percent control of target weeds in each riparian corridor

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Ridge and Valley, Ridge and Valley, Appalachian Plateaus, Appalachian Plateaus. Physiographic Section: Pittsburgh Low Plateau, Allegheny Mountain, Allegheny Front, Deep Valleys, Glaciated High Plateau, Glaciated Low Plateau, Appalachian Mountain, Susquehanna Lowland, Anthracite Valley, Glaciated Low Plateau, Glaciated Pocono Plateau

Other species likely to benefit from this action: a wide variety of riparian plants

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Big Sand Tiger Beetle

Cicindela formosa

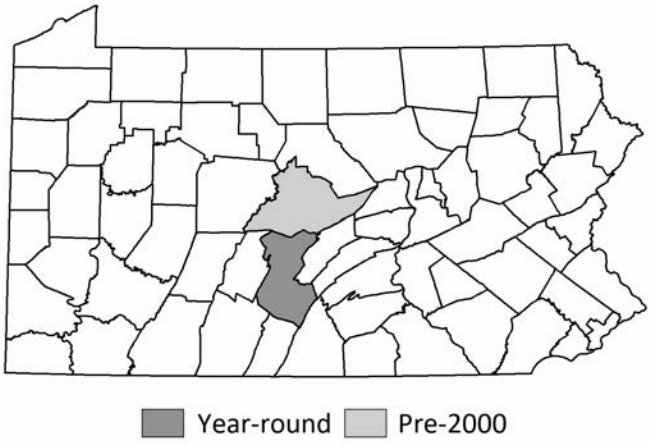
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Protect the last known population in the state, and create new habitat in the vicinity to allow the population to spread.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Sparsely vegetated, very sandy soil

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** High - Low

Specific Threat: In the absence of any disturbance, succession would eventually make the habitat unsuitable.

Action Category: Conservation planning

Specific Action: Create a site management plan for the one known site that incorporates the needs of the rare tiger beetles that are present. Evaluate the possibility of using fire, or other vegetation suppression methods, to expand the habitat.

Objective: Completion of a management plan for the site, which includes a disturbance regime that is compatible with the persistence and growth of the tiger beetle colony.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Finalization of the management plan for this site.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources

Locations: Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Cicindela patruela, which occurs at the same site. There may also be other rare invertebrates, such as bees and wasps, that occur here and which would also benefit from opening up more sandy habitat.

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** High - Low

Specific Threat: In the absence of any disturbance, succession would eventually make the habitat unsuitable (This is probably what happened to the population at Scotia Barrens).

Action Category: Conservation planning

Specific Action: Create a site managment plan for the one known site that incorporates the needs of the rare tiger beetle that are present. Evaluate various methods of vegetation suppression (fire, herbicide, topsoil removal, etc.) to maintain and expand the open habitat.

Objective: Completion of a management plan for the site, which includes a disturbance regime that is compatible with the persistence and growth of the tiger beetle colony.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Finalization of the management plan for this site

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources

Locations: Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Cicindela patruela, which occurs at the same site. There may also be other rare invertebrates, such as bees and wasps, that occur here and which would also benefit from opening up more sandy habitat.

Season: Year-round

Threat Category: Recreational Activities **Threat Impact:** High - Medium

Specific Threat: ATV traffic would kill larvae in the small single remaining site in PA.

Action Category: Manage non-living habitat components

Specific Action: Stop ATV traffic in the last remaining site in PA.

Objective: Adopt and enforce a no-ATV policy for the site.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Periodic visits to the site to determine if ATV use has occurred recently.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources

Locations: Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Cicindela patruela, and possible bee and wasp species of concern.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Hairy-necked Tiger Beetle

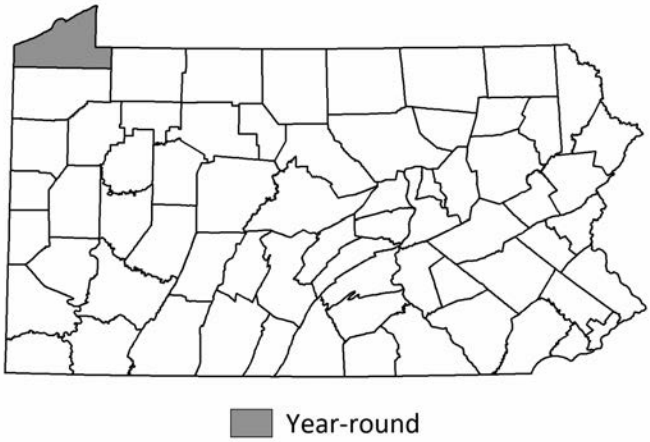
Cicindela hirticollis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain population levels through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Deep loose sand deposits are required for adult and larval habitat.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Recreational Activities **Threat Impact:** Low

Specific Threat: Foot traffic and other disturbances may impact larval habitat, especially at beaches 10 and 11. Gull Point is fairly safe from foot disturbance due to the breeding shorebird restrictions.

Action Category: Other legal actions

Specific Action: Maintain policies of keeping people off Piping Plover habitat (ie, Gull Point) during the breeding season. This will protect other sand barren specialist species that are vulnerable to foot traffic.

Objective: Minimize effects of foot traffic on most parts of Gull Point.

Action Priority: **Action Urgency:** Initiate immediately **Measure:** Occupancy of various stretches of beach.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Cobblestone Tiger Beetle

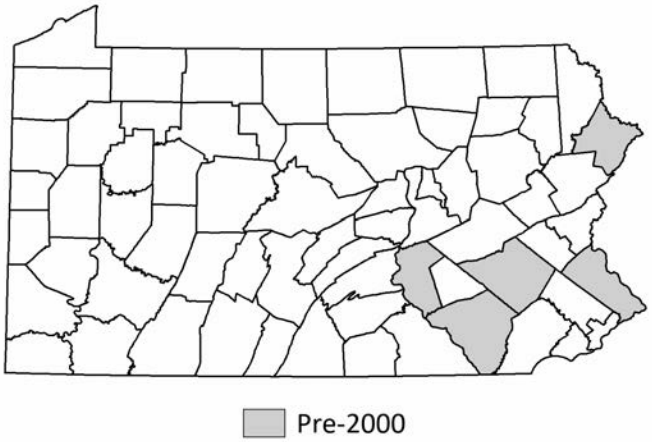
Cicindela marginipennis

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Improve habitat on occupied and non-occupied islands to allow population to grow and spread.

NatureServe Global Rank: G3

IUCN Red List Designation: Vulnerable

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: Scoured cobblestone habitat on the upstream and lateral sides of islands and cobble bars. Habitat is above the sparsely vegetated, frequently inundated shoreline, in the zone where periodic scouring removes vegetation.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Medium

Specific Threat: Most scouring of the cobble islands happens when ice locks onto vegetation and then floats away, or when ice chunks scrape soil away the upstream end of an island. In recent years the river has not frozen all the way across like it used to, so ice scour is severely decreased. The severity of the effect over the next decade is uncertain.

Action Category: Manage non-living habitat components

Specific Action: Work with operators of the Kinzua Dam to incorporate management for scour habitat into their management plans. See the entry under the Dams and Water Management/Use threat. Use of water pulses may be able to compensate for some of the lack of river ice.

Objective: To allow occasional pulses of water that are sufficiently large to create scoured habitat on the islands of the Allegheny River.

Action Priority: **Action Urgency:** **Measure:** condition of islands

Potential Collaborators:

Locations: HUC4 Watershed: Allegheny

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** High - Low

Specific Threat: The reservoir upstream of the site suppresses the flooding regime, which decreases scour of the habitat. Scouring from floods may be more important than ever now that ice scouring is largely gone.

Action Category: Manage non-living habitat components

Specific Action: Work with operators of the Kinzua Dam to incorporate management for scour habitat into their management plans.

Objective: To allow occasional pulses of water that are sufficiently large to create scoured habitat on the islands of the Allegheny River.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** habitat conditions on islands

Potential Collaborators: Other federal agency

Locations: HUC4 Watershed: Allegheny

Other species likely to benefit from this action: Blue False-indigo (Baptisia australis) big bluestem – Indian-grass river grassland natural community

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Medium

Specific Threat: Most scouring of the cobble islands happens when ice locks onto vegetation and then floats away, or when ice chunks scrape soil away the upstream end of an island. In recent years the river has not frozen all the way across like it used to, so ice scour is severely decreased. The severity of the effect over the next decade is uncertain.

Action Category: Manage non-living habitat components

Specific Action: Implement a disturbance regime to set back succession on the cobble scour zone of islands, to restore habitat for the beetle.

Objective: Select two islands in the middle Allegheny River, not too far from the islands occupied by cobblestone tiger beetles, for a pilot project. Using herbicides, water cannons, or some other method, remove vegetation and sediment from the cobble zone at the head of the islands.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Area of vegetation treated

Potential Collaborators: U.S. Army Corps of Engineers

Locations: HUC4 Watershed: Allegheny. HUC6 Watershed: Allegheny, Allegheny. HUC8 Watershed: Mid. Allegheny-Tionesta. HUC10 Watershed: Lower Allegheny R. (Mid. Allegheny-Tionesta), Allegheny R. (Mid. Allegheny-Redbank)

Other species likely to benefit from this action: Baptisia australis

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	The upper Susquehanna River has not been adequately surveyed for cobblestone tiger beetles.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Northern Barrens Tiger Beetle

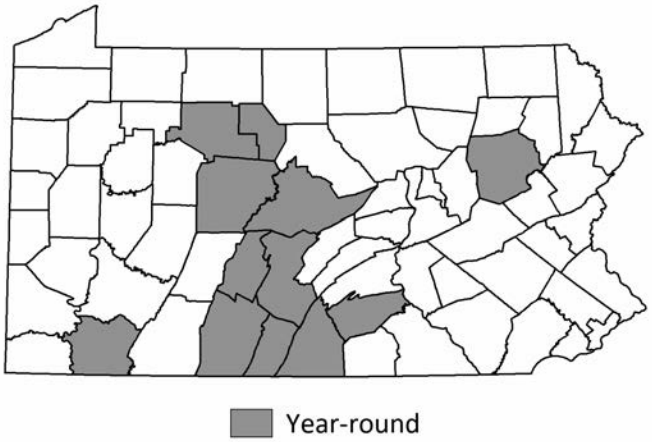
Cicindela patruela

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain population levels through 2035, and continue disturbance regimes that allow beetles to colonize new habitats over time.

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Sandy, sparsely vegetated habitats, often on ridgetop rights-of-way.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Northern Appalachian-Acadian Rocky Heath Outcrop

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** High - Low

Specific Threat: Fire suppression allows success of vegetation in previously sparsely vegetated habitats.

Action Category: Manage non-living habitat components

Specific Action: Incorporate this species into land management plans. Consider using fire to open up the habitat.

Objective: For all occurrences on state land, incorporate this species into management plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of management plans that specifically include consideration of this species.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Physiographic Province: Ridge and Valley. Physiographic Section: Allegheny Mountain, Pittsburgh Low Plateau, Deep Valleys, Allegheny Front, Appalachian Mountain, Susquehanna Lowland, Anthracite Upland, South Mountain, Appalachian Mountain

Other species likely to benefit from this action: Other invertebrates that are specialists on barrens habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Festive Tiger Beetle

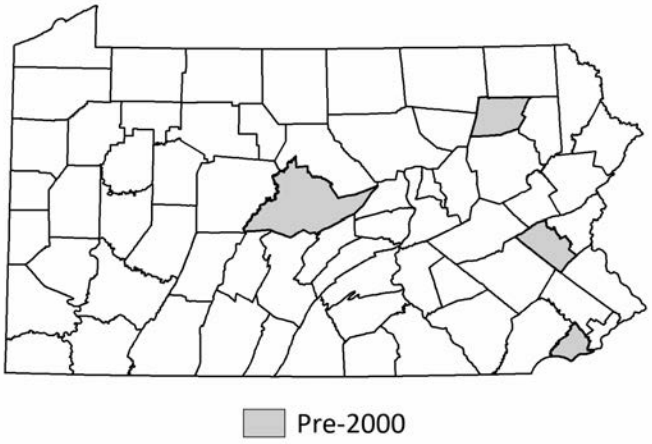
Cicindela scutellaris

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Manage sandy habitats to keep them open, to facilitate the return of the festive tiger beetle to Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SX

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Open sandy habitats, such as openings in grasslands and forests, and sometimes road cuts.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Fire suppression allows success of vegetation in previously sparsely vegetated habitats.

Action Category: Manage non-living habitat components

Specific Action: Use fire to restore barrens habitats.

Objective: Incorporate tiger beetles into management plans and burn plans on state land.

Action Priority: 3-Medium

Action Urgency: Can wait 10 years to initiate

Measure: Number of management plans that specifically include consideration of tiger beetles

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: Cicindela patruela, Cicindela formosa, and other invertebrates that are specialists on barrens habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Splendid Tiger Beetle

Cicindela splendida

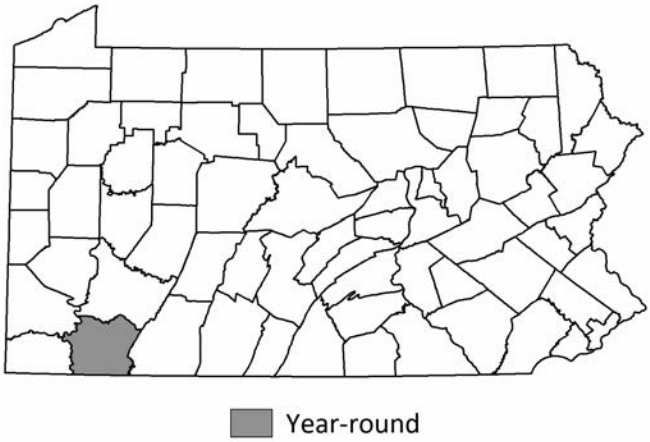
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035, and improve our knowledge of the species' distribution.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Open sandy habitats, including ROWs, paths through xeric meadow, openings in woodlands.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** High - Low

Specific Threat: Fire suppression allows success of vegetation in previously sparsely vegetated habitats.

Action Category: Conservation planning

Specific Action: Incorporate management for this species into plans for the sites where it occurs on state land. Provide for an appropriate disturbance regime to maintain open habitat, whether it is prescribed fire, herbicide, or other disturbance.

Objective: Include this species in management plans for all sites where this species is known to be on state land.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of plans updated

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Physiographic Province: Appalachian Plateaus. Physiographic Section: Allegheny Mountain

Other species likely to benefit from this action: Cicindela patruela, Cicindela limbalis

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

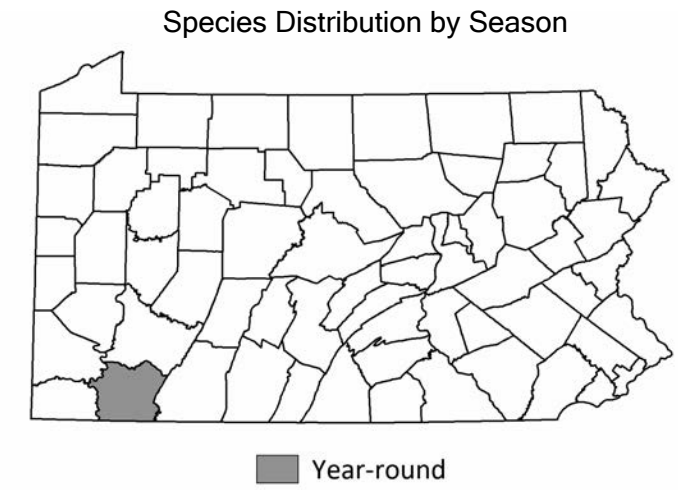
One-spotted Tiger Beetle

Apterodela unipunctata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035, and improve our understanding of the distribution of this species in Pennsylvania.

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Deciduous forests; mesic to dry. Unlike other tiger beetles, this species lives in closed canopy forests.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Microstegium is spreading rapidly in this part of the state. Coverage within the next 10 years is difficult to predict, but if often forms thick carpets in forests, and thus is likely to exclude this surface to sub-litter forager.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control stiltgrass (Microstegium vimineum) in the area surrounding the site where this beetle is known to occur.

Objective: Map the extent of the stilt grass infestation. Identify priority areas for treatment. Treat infestations with herbicide.

Action Priority: **Action Urgency:** Initiate within 5 years **Measure:** Change in area of infestation.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources

Locations: HUC10 Watershed: Redstone Cr., Georges Cr.

Other species likely to benefit from this action: A large number of native understory herbs would benefit from this action.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys for one-spotted tiger beetle are needed elsewhere on Chestnut Ridge and in Pennsylvania in general. This species is probably more widely distributed than we are aware of.	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ghost Tiger Beetle

Ellipsoptera lepida

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine the feasibility of restoring this species to Presque Isle.

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SX

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Open sandy habitat. The only PA population was on Presque Isle, but there is little hope that it still remains there.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Unknown

Specific Threat: The globally vulnerable ghost tiger beetle has apparently been eradicated from Presque Isle. Succession and changing land use on the peninsula may be the reason.

Action Category: Conservation planning

Specific Action: Evaluate the potential for reintroduction of the ghost tiger beetle to Pennsylvania.

Objective: Write a report evaluating the potential for reintroduction.

Action Priority: **Action Urgency:** Initiate within 5 years **Measure:** publication of report

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action:

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

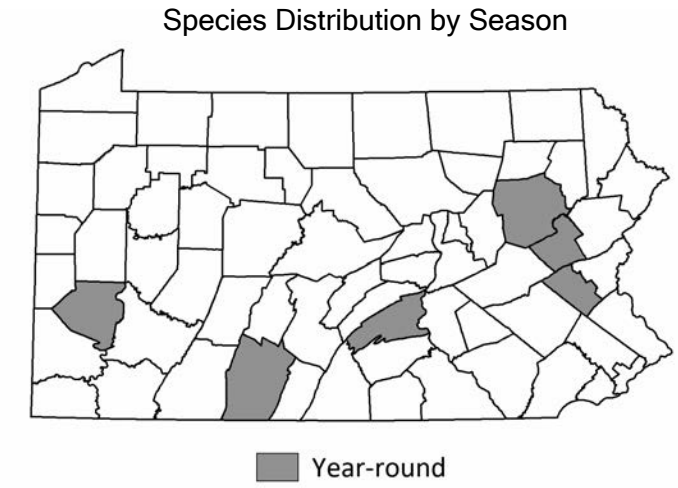
Cowpath Tiger Beetle

Cicindela purpurea

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the distribution of the species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Upland habitats with shale soils. Forest clearings, trails through open meadow. In one case, on fine-grained shale/clay mine tailings.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** High - Medium

Specific Threat: Fire suppression allows success of vegetation in previously sparsely vegetated habitats.

Action Category: Conservation planning

Specific Action: Incorporate management for this species into plans for the sites where it occurs on state land. Provide for an appropriate disturbance regime to maintain open habitat, whether it is prescribed fire, herbicide, or other disturbance.

Objective: Include this species in management plans for all sites where this species is known to be on state land.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of plans updated

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: Cicindela patruela, Cicindela limbalis

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Marchand's Crane Fly

Eutonia marchandi

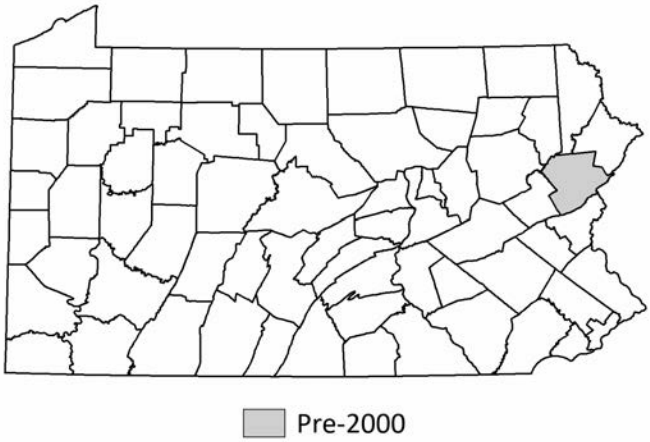
Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Read

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Alga on the shade cliffs with vernal rock seeps; adjacent to streams, waterways

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Sediment and pesticides from runoff; golf course adjacent to known location

Action Category: Outreach, communication and distribution

Specific Action: Communicate with landowners adjacent to the known habitats about preventing runoff and collaboration for water quality or habitat improvement projects

Objective: Prevent runoff and habitat degradation or improve conditions

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of landowners and successful communications

Potential Collaborators: Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts

Locations: HUC8 Watershed: Mid. Delaware-Mongaup-Brodhead

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ash Bullet Gall Midge

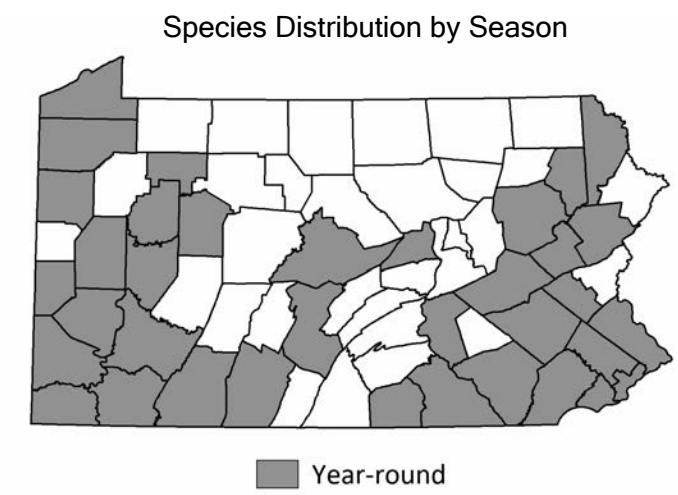
Dasineura pellex

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal: Restore Fraxinus populations in Pennsylvania before this species becomes extirpated.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-80%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Lives on the foliage of white ash (Fraxinus americana).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. D. pellex is still extant, presumably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Swollen Ash Gall Midge

Dasineura tumidosae

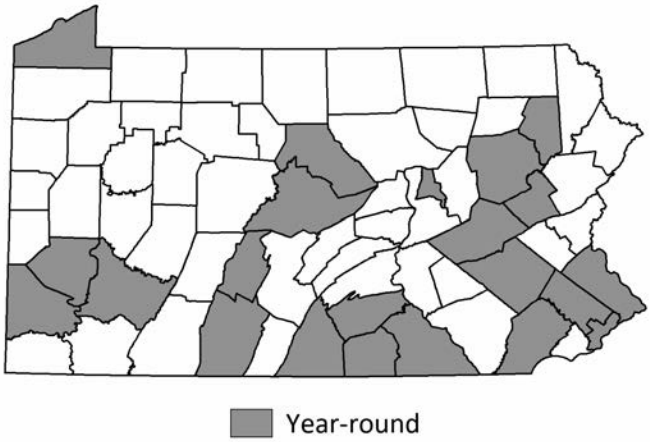
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Hammond

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Restore some populations of Fraxinus before this species becomes extirpated.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >70%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Lives on the foliage of white ash (Fraxinus americana)

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. D tumidosae is still extant, presumably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

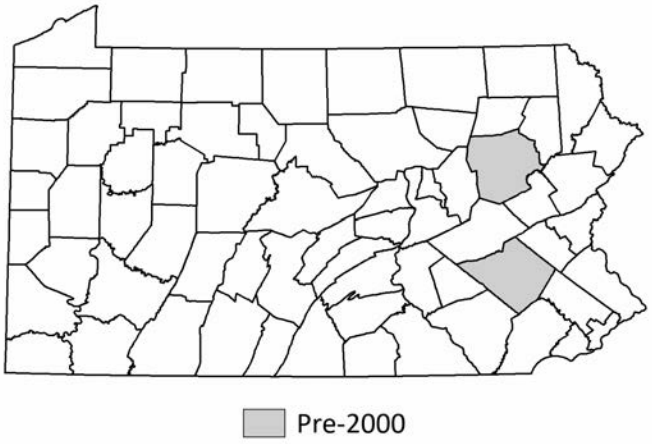
Phalacrocera tipulina

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Sphagnum bog mosses

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for wetland craneflies and other wetland organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for wetlands in a plan

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Non-governmental organizations, Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wetland organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

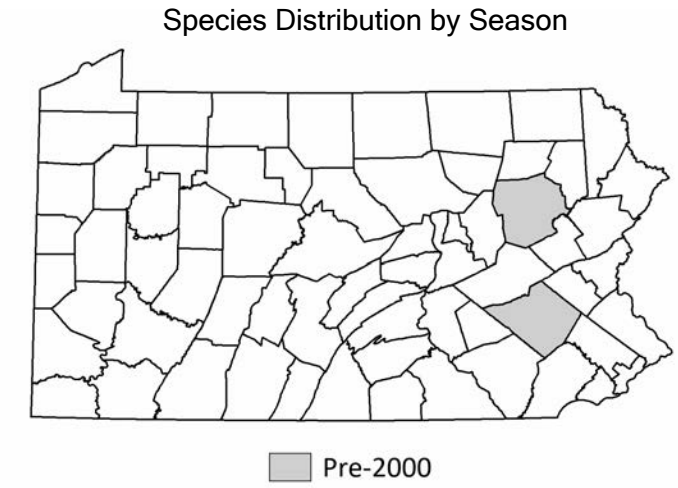
A crane fly

Pilaria stanwoodae

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: bog soils

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for wetland craneflies and other wetland organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for wetlands

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Universities & research institutions, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: Statewide

Other species likely to benefit from this action: Other wetland organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

No known monitoring programs.

Crane Flies of Pennsylvania: Preliminary Checklist and Database Development with Emphasis on Aquatic Species

PENNSYLVANIA WILDLIFE ACTION PLAN

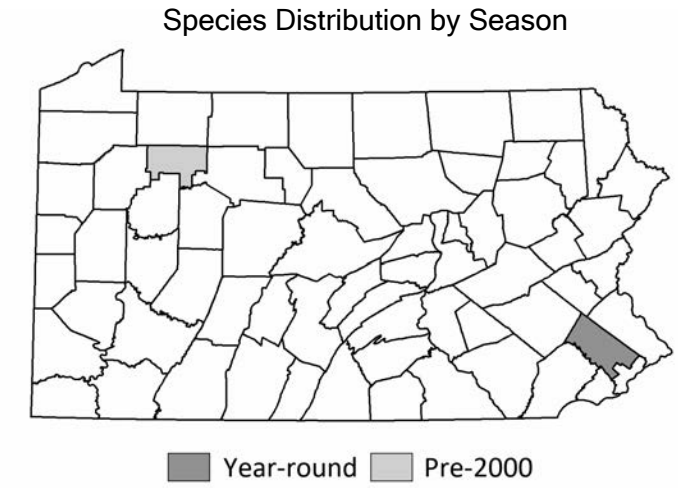
A crane fly

Pilaria vermontana

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: bog soils

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for wetland craneflies and other wetland organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for wetlands

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Non-governmental organizations, Conservancies & Land Trusts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wetland organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

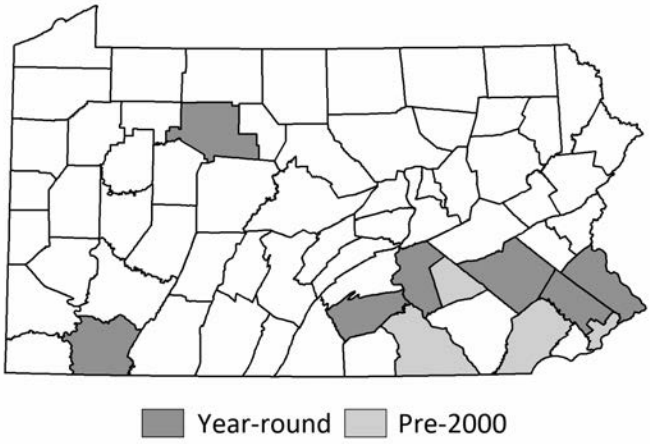
Brachypremna dispellens

Mary Walsh ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



C. Wilson

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Moist, stream-side soils

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cold, Headwaters and Creeks

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cold, Headwaters and Creeks

Habitat Comments: Moist, stream-side soils

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Low

Specific Threat: Urbanization and land conversion, especially in SE PA

Action Category: Manage non-living habitat components

Specific Action: Manage streamside habitats to minimize disturbance from development (e.g. riparian buffers)

Objective: Maintain streamside habitat in natural condition

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Number of feet of streamside habitat maintained or restored

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Lower Delaware, Crosswicks-Neshaminy, Schuylkill, Lower Susquehanna-Swatara, Youghiogheny, Clarion

Other species likely to benefit from this action: Other stream and streamside organisms

Season: Year-round

Priority	Need	Partners
1	Habitats and threats	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Survey potential habitats to expand knowledge of distribution	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

No known monitoring programs.

Crane Flies of Pennsylvania: Preliminary Checklist and Database Development with Emphasis on Aquatic Species

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

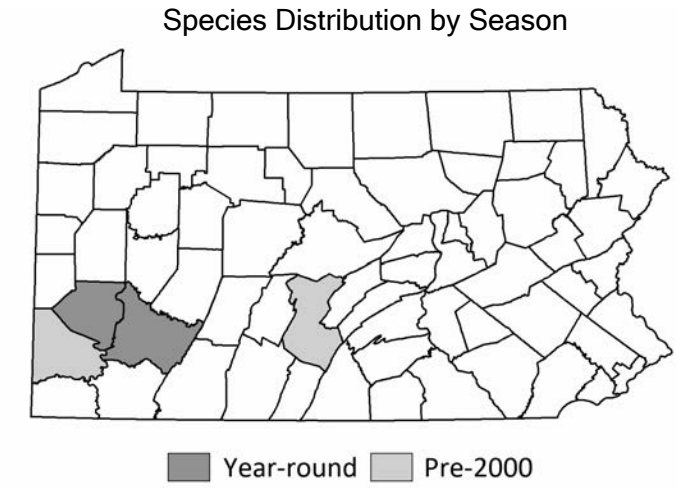
Dactylolabis montana

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



N. Block



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, habitat needs and maintain the current populations over 10 years.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: vernal rock seeps

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Intensive agriculture

Action Category: Manage non-living habitat components

Specific Action: Protect seep habitats from intrusion of agriculture or other destruction

Objective: Maintain seep habitat

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of seeps preserved through easements and other land conservation measures

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Raystown, Kiskiminetas, Lower Allegheny, U. Ohio-Wheeling

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Habitat study	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	Distribution survey	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

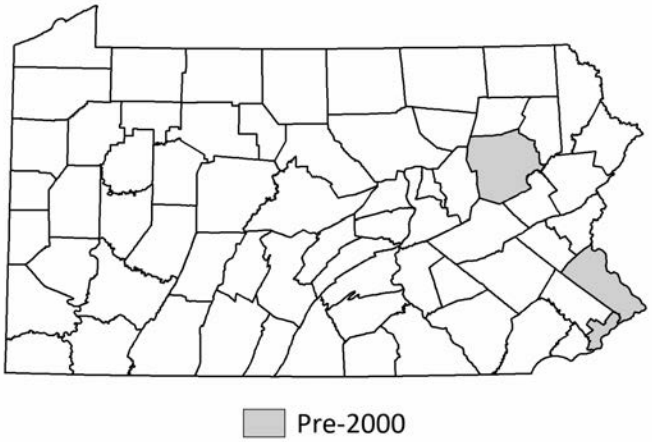
Geranomyia diversa

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Larvae and pupae occur in wet algae growing on shaded cliffs that are adjacent to waterways.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium

Specific Threat: Destruction of habitat from development

Action Category: Conservation planning

Specific Action: Create a conservation plan for habitat and determine threats that can be mitigated from development.

Objective: Reduce threats from habitat loss and indirect impacts with conservation planning

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Lower Delaware, Crosswicks-Neshaminy

Other species likely to benefit from this action: Other organisms inhabiting similar habitats

Season: Year-round

Priority	Need	Partners
1	threats to habitat	

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

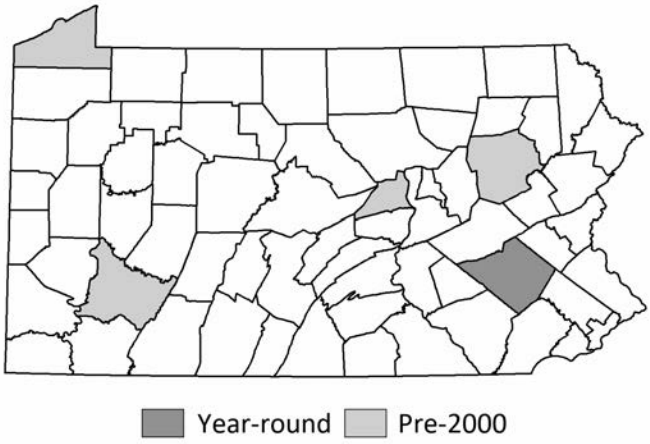
Limnophila tenuicornis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Freshwater Marsh

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Develop conservation plan for aquatic craneflies and managing climate change

Objective: Mitigate the effects climate change on aquatic craneflies

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Conservation plan created

Potential Collaborators: Non-governmental organizations, Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Habitat and threats	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	Universities & research institutions, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts

No known monitoring programs.

Crane Flies of Pennsylvania: Preliminary Checklist and Database Development with Emphasis on Aquatic Species

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

Tanyptera dorsalis

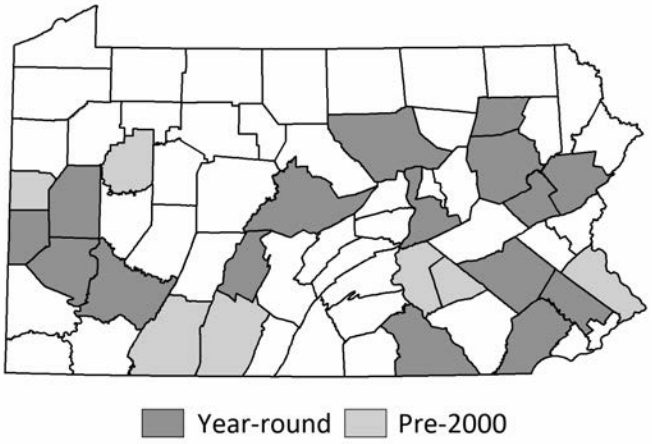
Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Tome

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Rotting wood in forested habitats

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium

Specific Threat: Conversion of natural areas to residential and other development

Action Category: Outreach, communication and distribution

Specific Action: Promote prevention of woodland habitat management (sustainable forestry practices, encouraging woody debris, etc) through outreach campaigns.

Objective: Improve woodland habitats for craneflies

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Outreach completed within 5 years

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Private Landowners, Township Zoning Boards, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Woodland craneflies and other organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions

No known monitoring programs.

Crane Flies of Pennsylvania: Preliminary Checklist and Database Development with Emphasis on Aquatic Species

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

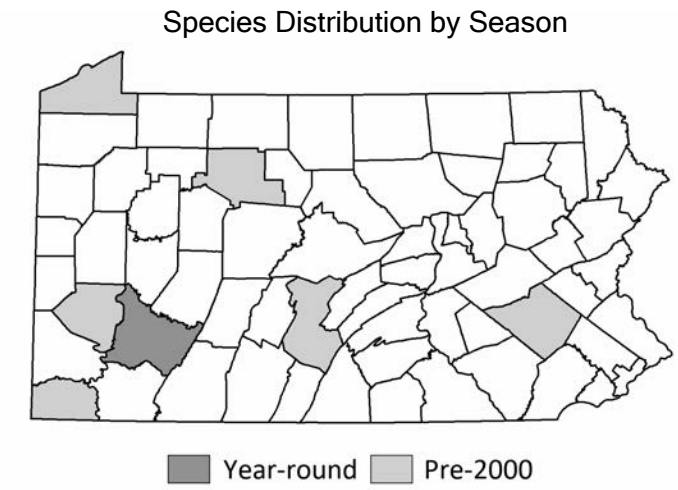
Tipula apicalis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



kwg555



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Larvae develop in rotting wood in deciduous woods

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Logging and Wood Harvesting **Threat Impact:** Low

Specific Threat: Logging/ habitat management/succession

Action Category: Outreach, communication and distribution

Specific Action: Promote woodland habitat management (sustainable forestry practices, encouraging woody debris, etc) through outreach campaigns.

Objective: Improve woodland habitats for craneflies

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Outreach completed within 5 years

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Universities & research institutions

Locations: HUC8 Watershed: Chautauqua-Conneaut, Schuylkill, Clarion, Lower Monongahela, Kiskiminetas, U. Juniata

Other species likely to benefit from this action: Other woodland craneflies and other organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

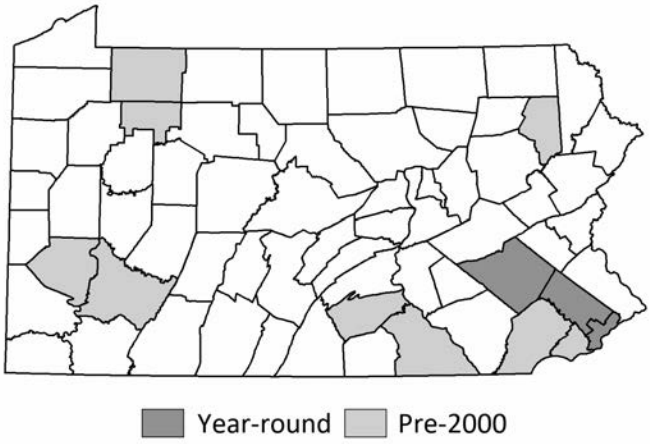
Tipula dejecta

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: mosses and leaves in bogs

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for wetland craneflies and other wetland organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for wetlands in a plan

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Universities & research institutions, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection

Locations: Statewide

Other species likely to benefit from this action: Other bog/wetland species

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions, Pennsylvania Fish and Boat Commission

No known monitoring programs.

Crane Flies of Pennsylvania: Preliminary Checklist and Database Development with Emphasis on Aquatic Species

PENNSYLVANIA WILDLIFE ACTION PLAN

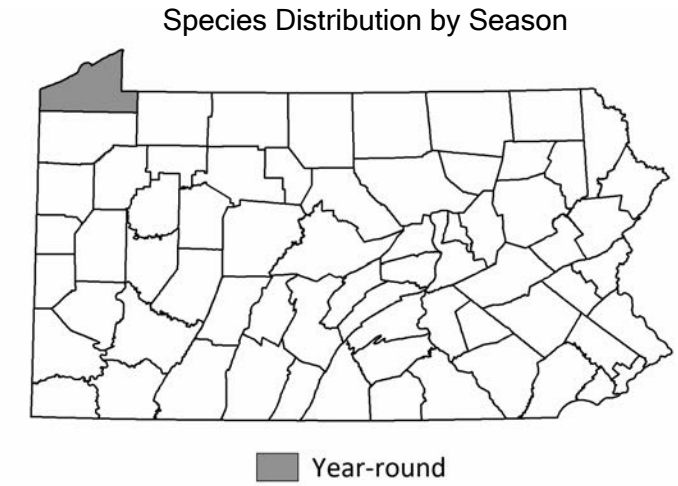
A crane fly

Tipula dorsimacula

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: grasslands and woodland openings with grassy herbaceous growth

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive species encroachment in grasslands

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Manage invasive species and woody vegetation in grasslands

Objective: Maintain grassland habitat

Action Priority: **Action Urgency:** Initiate within 5 years **Measure:** Acres of grassland managed

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Non-governmental organizations

Locations: HUC8 Watershed: Chautauqua-Conneaut

Other species likely to benefit from this action: Other grassland flora and fauna

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions, Pennsylvania Department of Conservation and Natural Resources

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

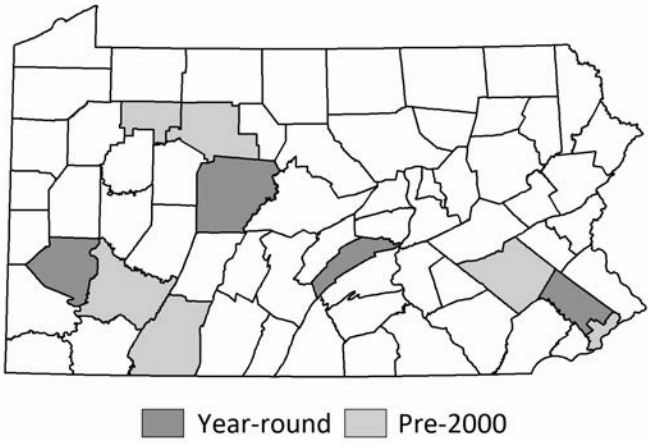
Tipula jacobus

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Freshwater Marsh

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for wetland craneflies and other wetland organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for wetlands in a plan

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Universities & research institutions, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: Statewide

Other species likely to benefit from this action: Other wetland species

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Universities & research institutions, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

No known monitoring programs.

Crane Flies of Pennsylvania: Preliminary Checklist and Database Development with Emphasis on Aquatic Species

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

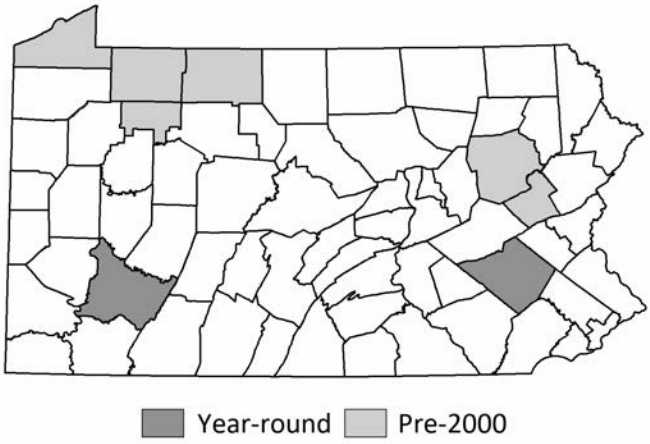
Tipula nobilis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Ponds and small streams with leaf litter

Primary Habitat: Palustrine

Primary Habitat Type: Vernal Pools/Ephemeral Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Sediment and pesticides

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to water quality and habitat

Objective: Improve water quality and habitats

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, habitat metrics

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Private Landowners, Universities & research institutions

Locations: HUC8 Watershed: Chautauqua-Conneaut, Mid. Allegheny-Tionesta, Kiskiminetas, Lehigh, Schuylkill

Other species likely to benefit from this action: Other pool species

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

No known monitoring programs.

Crane Flies of Pennsylvania: Preliminary Checklist and Database Development with Emphasis on Aquatic Species

PENNSYLVANIA WILDLIFE ACTION PLAN

A crane fly

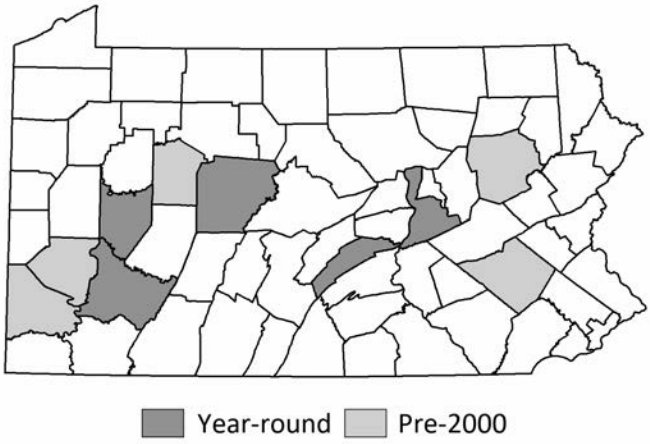
Tipula noveboracensis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Livestock Farming and Ranching

Threat Impact: Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to water quality and habitat

Objective: Improve water quality and habitats

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC8 Watershed: Clarion, Mid. Allegheny-Redbank, Lower Allegheny, U. Ohio, U. Ohio-Wheeling, Kiskiminetas, U. W. Br. Susquehanna, Lower Juniata, Lower Susquehanna-Penns, Schuylkill, U. Susquehanna-Lackawanna

Other species likely to benefit from this action: Other aquatic species

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions, Pennsylvania Fish and Boat Commission

No known monitoring programs.

Crane Flies of Pennsylvania: Preliminary Checklist and Database Development with Emphasis on Aquatic Species

PENNSYLVANIA WILDLIFE ACTION PLAN

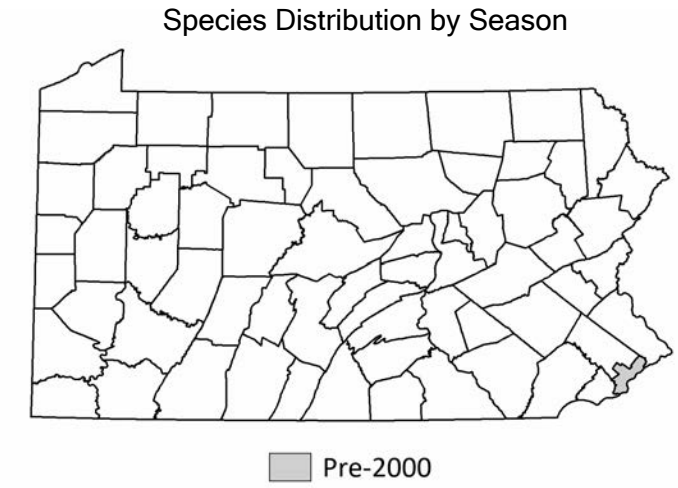
A crane fly

Tipula subeluta

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Estuarine

Primary Habitat Type: Tidal Wetlands & Flats

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Coastal sea level rise/ salt intrusion

Action Category: Conservation planning

Specific Action: Develop a plan for sea level rise and habitat conservation actions in coastal marshes

Objective: Ameliorate impacts of sea level rise on coastal marsh habitats

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Create plan

Potential Collaborators: U.S. Fish and Wildlife Service, Conservancies & Land Trusts, Delaware River Basin Commission, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Lower Delaware

Other species likely to benefit from this action: Other coastal marsh species

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Delaware River Basin Commission, Non-governmental organizations, Universities & research institutions, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Delaware River Basin Commission, Non-governmental organizations, Pennsylvania Fish and Boat Commission

No known monitoring programs.

Crane Flies of Pennsylvania: Preliminary Checklist and Database Development with Emphasis on Aquatic Species

PENNSYLVANIA WILDLIFE ACTION PLAN

A pitcher plant fly

Fletcherimyia fletcheri

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



E. Danielsen

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and improve our knowledge of the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: sphagnum bogs with pitcher plant (Sarracenia purpurea).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Medium - Low

Specific Threat: Sphagnum bogs are threatened by inputs of nitrogen, which hasten degradation of peat, and allow other plants to compete with bog specialist plants.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement.

Objective: Identify and prioritize bogs for protections. Pursue protection options at high priority sites.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts

Locations: Statewide

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris) Darlington's Harp Ground Beetle (Agonum darlingtoni)

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** Medium - Low

Specific Threat: Sphagnum bogs are threatened by inputs of nitrogen, which hasten degradation of peat, and allow other plants to compete with bog specialist plants.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement.

Objective: Identify and prioritize bogs for protection. Pursue protection options on priority bogs.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts

Locations: Statewide

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris) Darlington's Harp Ground Beetle (Agonum darlingtoni)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A robber fly

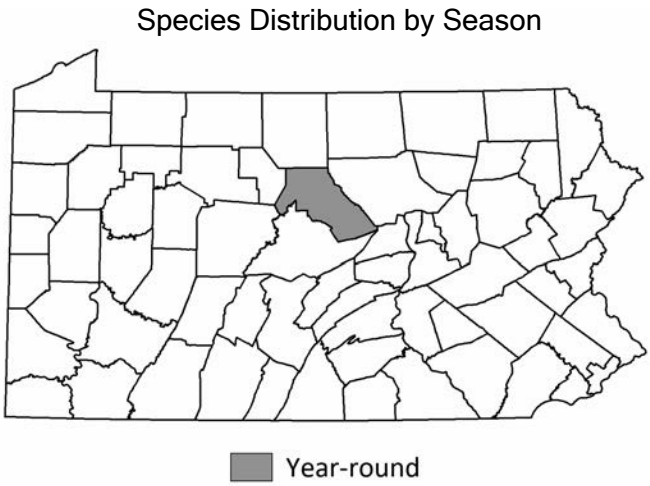
Laphria champlainii

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Coulter



Conservation Profile

PA 10-Year Conservation Goal: Maintain the known population through 2035, and improve our knowledge of the distribution of this species, by doing surveys in scrub oak habitats.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Scrub oak barrens. Pitch pine may be the larval habitat, and may be a necessary component.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Very High - Medium

Specific Threat: Fire suppression is the greatest threat to scrub oak communities. Burning extensive areas at one time is also a threat for this species and most invertebrates that specialize in this habitat.

Action Category: Manage non-living habitat components

Specific Action: Manage scrub oak barrens habitats with prescribed burns. Be careful to burn in patches, and spread out the burning of each site over many years, so that there is always a mix of young, medium, and older stands.

Objective: Work with landowners at Slaughtering Ground Barrens, and other scrub oak barrens, to develop and carry out prescribed burns.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: number of plans written and carried out

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus. Physiographic Section: Deep Valleys

Other species likely to benefit from this action: Pine Woods Underwing Moth (Catocala sp. 1 near jair) Trembling Sallow Moth (Chaetoglaea rhomba) Spiny Oakworm Moth (Anisota stigma) Waxed Sallow Moth (Chaetoglaea serrata) a noctuid moth (Feltia manifesta)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A leafminer fly

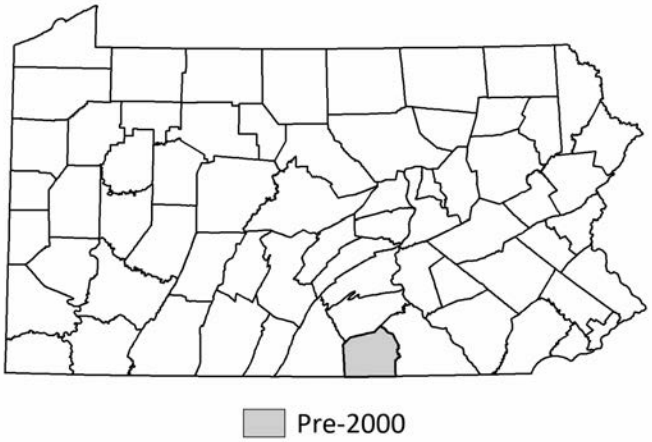
Liriomyza baptisiae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether the species is still present in Pennsylvania, and improve our knowledge of the species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open xeric habitats

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** High - Low

Specific Threat: Rights-of-way are important habitats for the host plants. Both host genera (Baptisia and Lupine) are vulnerable to ROW management practices such as indiscriminant herbicide spraying.

Action Category: Outreach, communication and distribution

Specific Action: Work with electric and gas ROW managers, and with landowners, to protect populations of New Jersey Tea (Ceanothus americanus), Wild Indigo (Baptisia tinctoria), and Sundial Lupine (Lupinus perennis) that are vulnerable to ROW management practices.

Objective: Identify populations of these plants on ROWs, and prioritize populations of each species by population size/area and by known presence of target invertebrate specialist species. Get landowners and managers to agree on management plans for each site.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of plans written.

Potential Collaborators: Businesses, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on Yellow Wild Indigo and would benefit from this action: Baptisia Seedpod Weevil (Apion rostrum), A leafminer fly (Liriomyza baptisiae), A lace bug (Leptopharsa heidemanni), Lupine Leafroller Moth (Anacampsis lupinella), Three-lined Grapholita (Grapholita tristrigana), A pyralid moth (Pococera baptisiella), Pearly Indigo Borer (Sitochroa dasconalis), Genista Broom Moth (Uresiphita reversalis)

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** High - Low

Specific Threat: Fire suppression is the main reason why the host plants are much less common than they once were in PA. Burning habitats in patches over time is probably critical; pupae of this tiny fly are probably not buried deeply enough to survive burns, so preservation of habitat patches as recolonization sources is critical when burning.

Action Category: Manage non-living habitat components

Specific Action: When conducting prescribed burns on state lands, identify Yellow Wild Indigo (Baptisia tinctoria) stands within the project area, and incorporate them into the project planning.

Objective: Conduct the burning in patches to ensure that no more than 25% of the Yellow False Indigo plants are disturbed by any one round of disturbance, and allow several years for recovery before additional patches of the plant are disturbed.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of burn projects that take Yellow Wild Indigo into consideration. Percent of Yellow False Indigo plants burned by each of those projects.

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Frosted Elfin (Callophrys irus), Baptisia Seedpod Weevil (Apion rostrum), A leafminer fly (Liriomyza baptisiae), A lace bug (Leptopharsa heidemanni), Lupine Leafroller Moth (Anacampsis lupinella), Three-lined Grapholita (Grapholita tristrigana), A pyralid moth (Pococera baptisiella), Pearly Indigo Borer (Sitochroa dasconalis), Genista Broom Moth (Uresiphita reversalis),

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

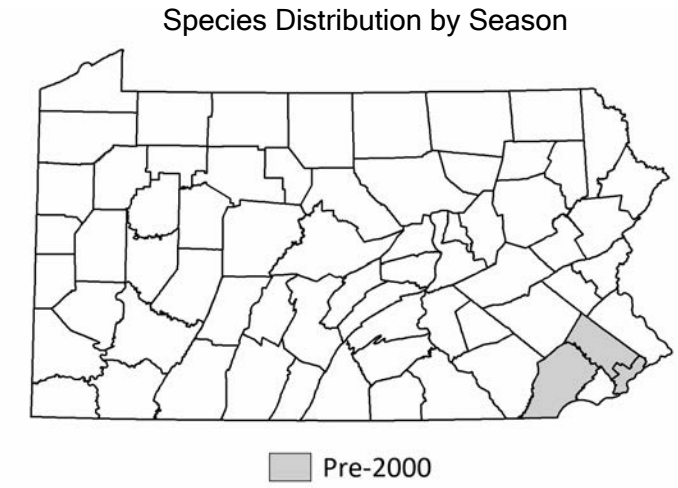
A cranefly

Nephrotoma cornifera

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GU

IUCN Red List Designation:

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status:

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation:

PA Abundance:

PA Short-term Trend (10-year):

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Habitat not well known, but the taxon is found in developed areas.

Primary Habitat: Developed

Primary Habitat Type: Developed Areas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Low

Specific Threat: Conversion of natural areas to residential and other development

Action Category: Outreach, communication and distribution

Specific Action: Communicate with managers at Valley Forge National park where there are known occurences to manage habitat.

Objective: Encourage conservation of the habitat (moist soils) in the park

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Information conveyed about habitat and integration into park management

Potential Collaborators: National Park Service

Locations: HUC8 Watershed: Lower Delaware, Schuylkill

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Threat to habitat	

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

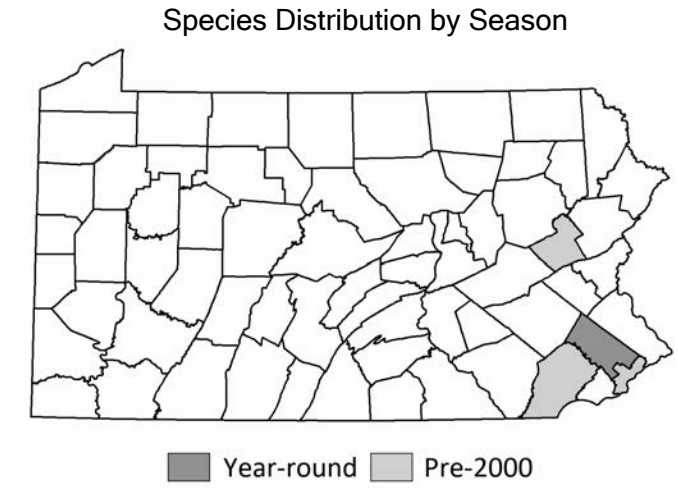
A cranefly

Nephrotoma polymera

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GU

IUCN Red List Designation:

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status:

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2025

PA Legal Designation:

PA Abundance:

PA Short-term Trend (10-year):

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Habitat not well known. Adults collected in suburban and urban areas.

Primary Habitat: Developed

Primary Habitat Type: Developed Areas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Removal of natural vegetation

Action Category: Outreach, communication and distribution

Specific Action: Through outreach campaigns, promote woodland and natural habitat management and ensure that habitats with wet soils are intact.

Objective: Ensure that woodlands and other natural habitat remain and preserve wet soil habitats for craneflies

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Outreach completed within 5 years

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities

Locations: HUC8 Watershed: Chester-Sassafras, Brandywine-Christina, Lower Delaware, Schuylkill

Other species likely to benefit from this action: Other woodland craneflies and invertebrates

Season: Year-round

Priority	Need	Partners
1	Threats to habitat	

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Beloved Rainbow Caddisfly

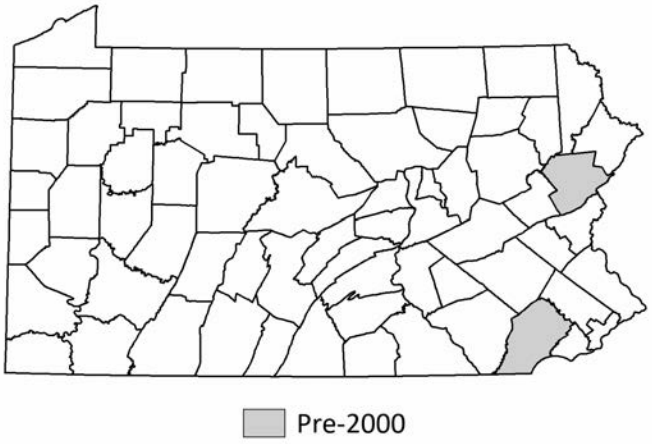
Agapetus iridis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: Other aquatic species

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A ring-horn microcaddisfly

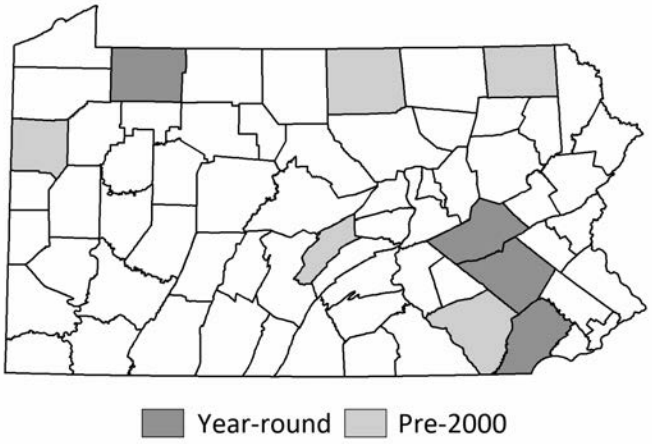
Leucotrichia pictipes

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: Other aquatic taxa

Season: Year-round

Priority	Need	Partners
1	threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	habitat and distribution surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A brachycentrid caddisfly

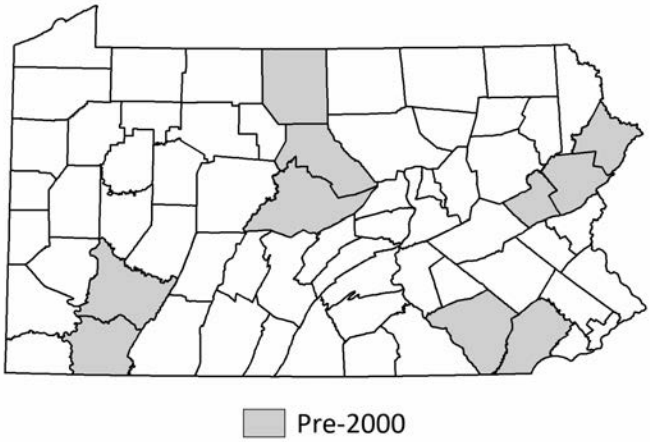
Adicrophleps hitchcocki

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Cold headwater streams, seeps, and springs

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Livestock Farming and Ranching

Threat Impact: Medium

Specific Threat: Intensive animal operations

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to water quality and habitat

Objective: Improve water quality and stream habitat

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators:

Locations: HUC8 Watershed: Mid. Delaware-Mongaup-Brodhead, Lower Susquehanna, Lehigh, Bald Eagle, Lower Susquehanna-Penns, U. Juniata, Pine, Kiskiminetas, Youghiogheny, U. W. Br. Susquehanna

Other species likely to benefit from this action: Other aquatic species

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

A Scalris Trichopteran

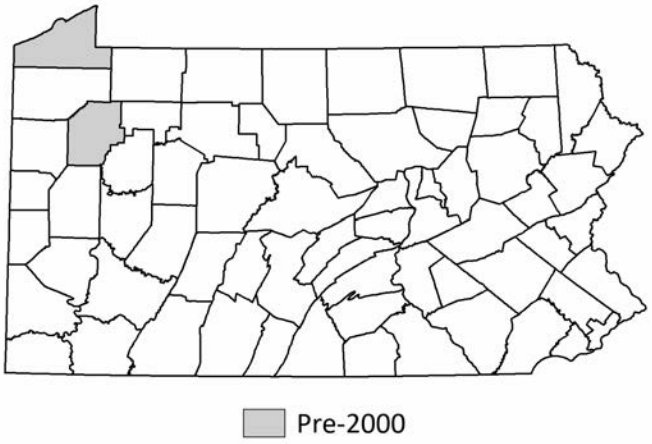
Hydropsyche brunneipennis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Small,cool streams to large rivers

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Temperature Extremes **Threat Impact:** Medium

Specific Threat: Altered temperatures

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organims

Season: Year-round

Priority	Need	Partners
1	Threat to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Toothed Microcaddisfly

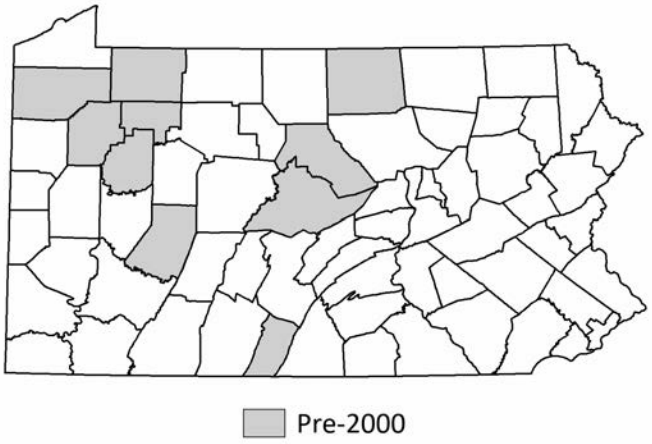
Hydroptila dentata

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G2G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Industrial and Military Effluents

Threat Impact: Low

Specific Threat: Acid mine drainage

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for mine drainage in prioritized locations

Objective: Ameliorate water quality and habitat

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts

Locations: HUC6 Watershed: W. Br. Susquehanna, Lower Susquehanna, Allegheny

Other species likely to benefit from this action: Other aquatic species

Season: Year-round

Priority	Need	Partners
1	Threat to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Mitchell's Autumn Mottled Sedge

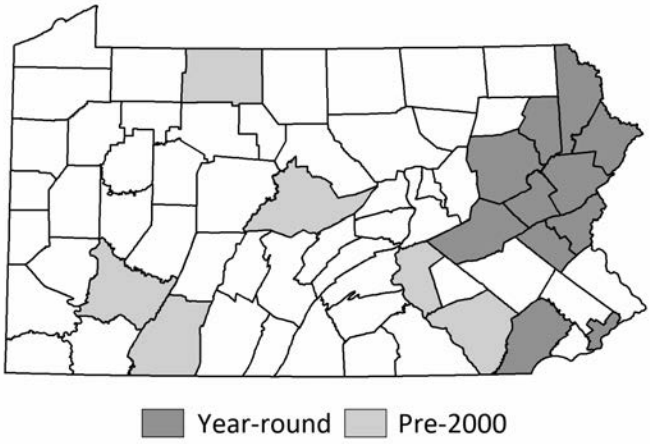
Neophylax mitchelli

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** "Plan created Plan created

Potential Collaborators: Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC8 Watershed: Mid. Delaware-Mongaup-Brodhead, Lehigh, Lower Delaware, Brandywine-Christina, Lower Susquehanna, Lower Susquehanna-Swatara, Lower Susquehanna-Penns, Bald Eagle, Youghiogheny, Kiskiminetas

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An Autumn Mottled Sedge

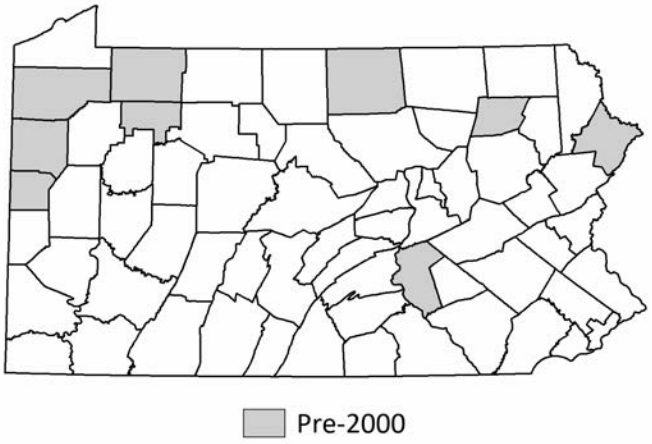
Neophylax stolus

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Cool, mid-sizes streams to warm, large creeks

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators: Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic taxa

Season: Year-round

Priority	Need	Partners
1	threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitats	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Wiggins' Autumn Mottled Sedge

Neophylax wigginsi

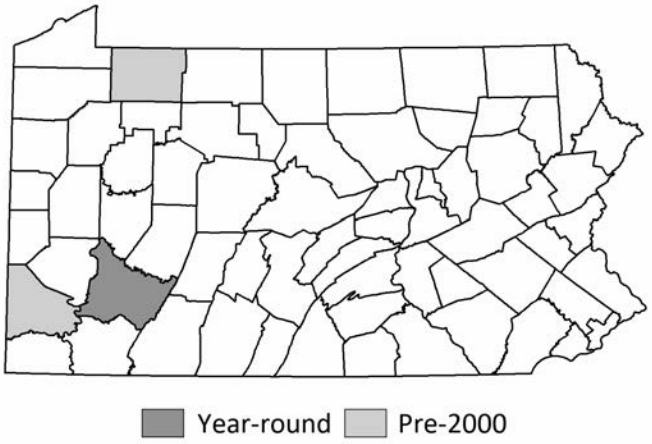
Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Spring runs

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology and temperatures

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: Other aquatic taxa

Season: Year-round

Priority	Need	Partners
1	threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Denning's Purse Case-maker Caddisfly

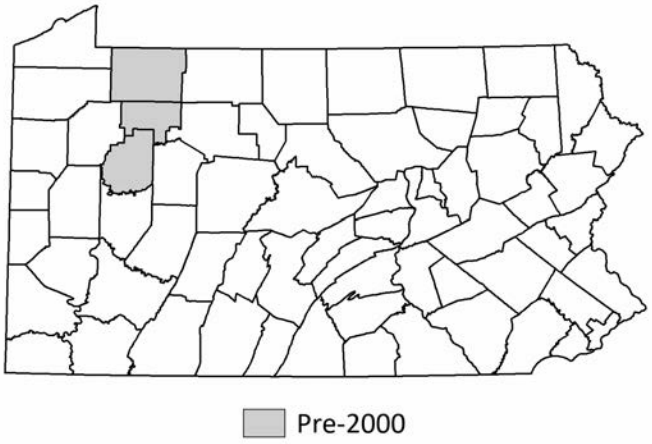
Ochrotrichia denningi

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G2G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Mesotrophic, Medium Alkalinity Lake

Season: Year-round

Threat Category: Temperature Extremes **Threat Impact:** Medium

Specific Threat: Altered temperatures

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators: Universities & research institutions, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	studies on threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	distribution and potential habitats surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Grayson's Purse Case-maker Caddisfly

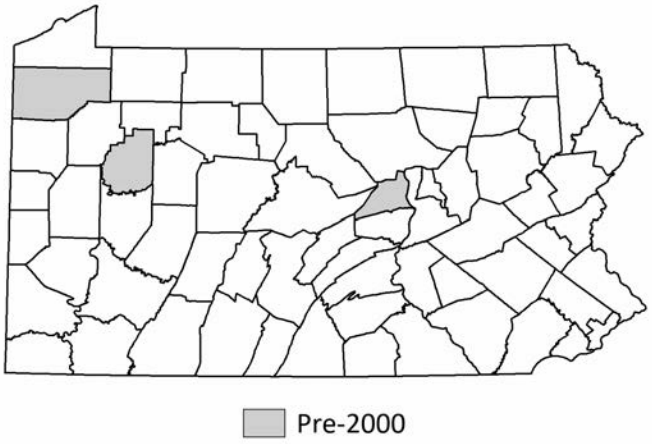
Ochrotrichia graysoni

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: Other aquatic taxa

Season: Year-round

Priority	Need	Partners
1	studies on threats to habitat	

Season: Year-round

Priority	Survey	Partners
1	Surveys for distribution and habitat	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Barr's Tube-maker Caddisfly

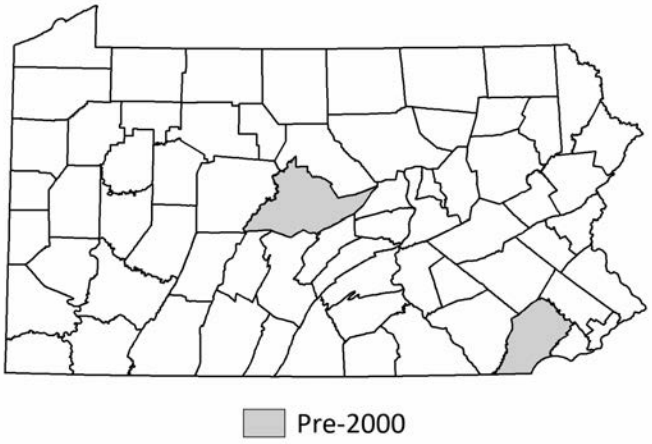
Polycentropus barri

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G2G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Small, cold streams

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Livestock Farming and Ranching

Threat Impact: Medium

Specific Threat: Intensive animal operations

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to waterways

Objective: Ameliorate water quality and habitat

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts

Locations: HUC8 Watershed: Lower Susquehanna, U. W. Br. Susquehanna

Other species likely to benefit from this action: Other aquatic species

Season: Year-round

Priority	Need	Partners
1	Threat to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A polycentropodid caddisfly

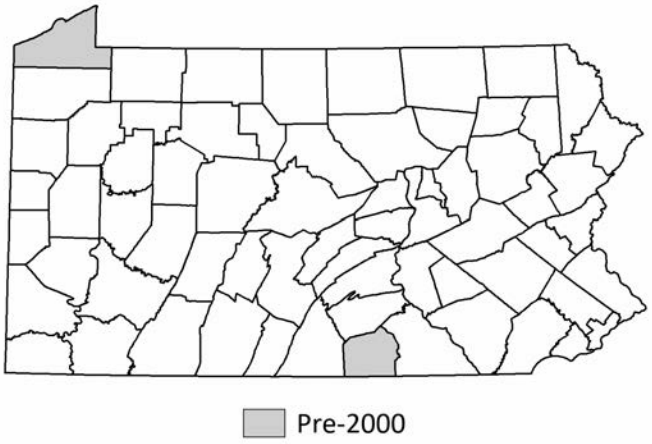
Polycentropus chenoides

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GU

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Small streams to medium-sized rivers

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered temperatures, hydrology

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: other aquatic taxa

Season: Year-round

Priority	Need	Partners
1	Studies of threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Harp's Tube-maker Caddisfly

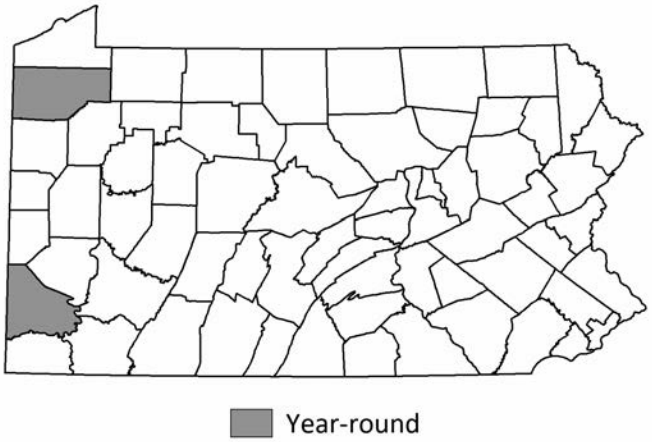
Polycentropus harpi

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: Other aquatic taxa

Season: Year-round

Priority	Need	Partners
1	threat to habitats	

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A caddisfly

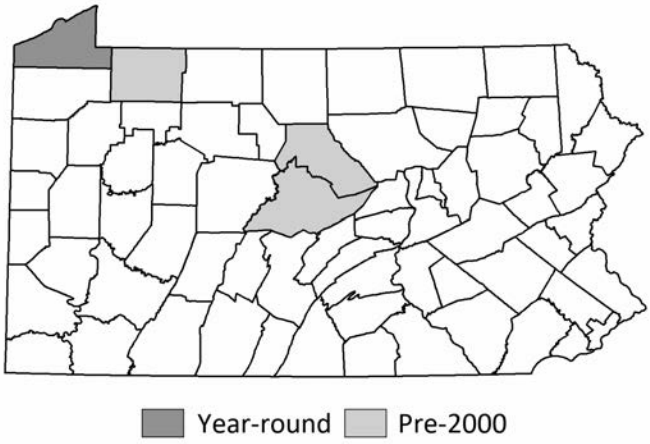
Pycnopsyche conspersa

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Cool, forested streams and small rivers, often with tannic waters

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create conservation plan addressing climate change threats to caddisflies and other organisms

Objective: Identify actions for mitigating climate change

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators: Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic taxa

Season: Year-round

Priority	Need	Partners
1	threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pocono Spiny Crawler Mayfly

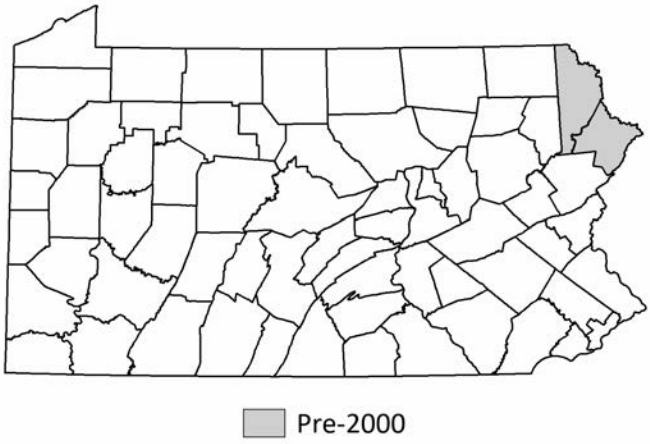
Eurylophella poconoensis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G1G2

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Glacial lakes

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for mayflies and other aquatic organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for stream organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** conservation plan created

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat	

No known monitoring programs.

Hoover, Gregory A. Biodiversity of Mayflies (Ephemeroptera) of Pennsylvania. The Pennsylvania State University, Department of Entomology, University Park, PA

Mayfly Central (website)

PENNSYLVANIA WILDLIFE ACTION PLAN

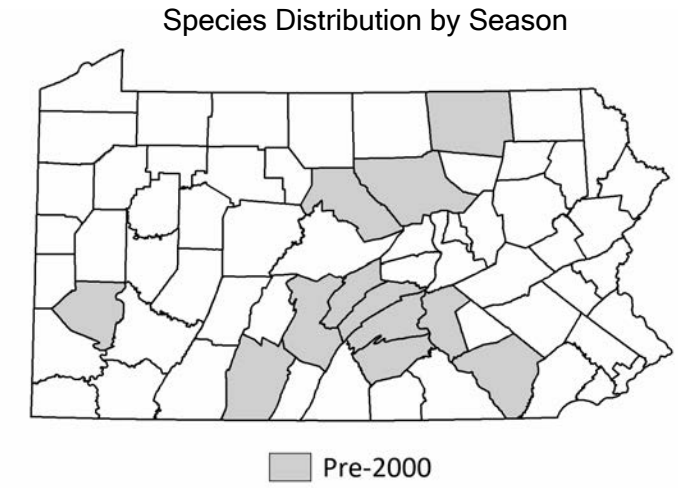
A mayfly

Heptagenia culacantha

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G2G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for mayflies and other aquatic organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for stream organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Habitat and threats	

Survey Priorities

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

Hoover, Gregory A. Biodiversity of Mayflies (Ephemeroptera) of Pennsylvania. The Pennsylvania State University, Department of Entomology, University Park, PA

Mayfly Central (website)

PENNSYLVANIA WILDLIFE ACTION PLAN

Gildersleeve's Stenacron Mayfly

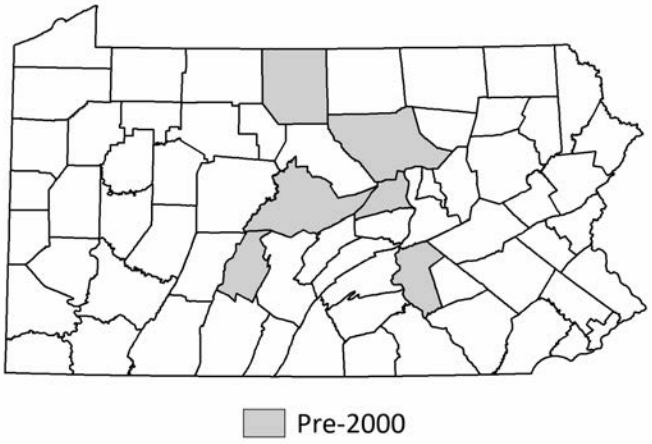
Stenacron gildersleevei

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Mid-size, cold streams to large warm rivers

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for mayflies and other aquatic organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for stream organisms

Action Priority: 1-Highest **Action Urgency:** **Measure:** conservation plan created

Potential Collaborators: Universities & research institutions, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Habitat and threats	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

Hoover, Gregory A. Biodiversity of Mayflies (Ephemeroptera) of Pennsylvania. The Pennsylvania State University, Department of Entomology, University Park, PA

Mayfly Central (website)

PENNSYLVANIA WILDLIFE ACTION PLAN

Rough Flat-headed Mayfly

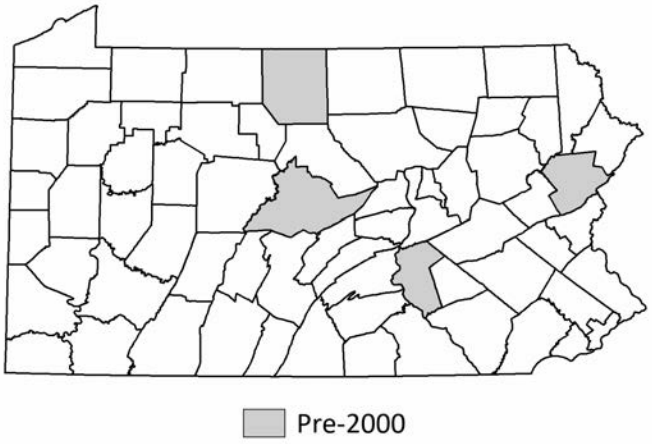
Nixe horrida

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G2G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: erosional areas of second and third order streams

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** Unknown

Specific Threat: Urban runoff and storm sewers, siltation

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for runoff impacts to stream water quality and habitat

Objective: Improve stream water quality and habitats

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: HUC8 Watershed: Bald Eagle, Lower Susquehanna-Penns, Mid. Delaware-Mongaup-Brodhead, Mid. W. Br. Susquehanna

Other species likely to benefit from this action: other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	Surveys to better define distribution, abundance and habitat parameters	

No known monitoring programs.

Hoover, Gregory A. Biodiversity of Mayflies (Ephemeroptera) of Pennsylvania. The Pennsylvania State University, Department of Entomology, University Park, PA

PENNSYLVANIA WILDLIFE ACTION PLAN

Rusty Flat-headed Mayfly

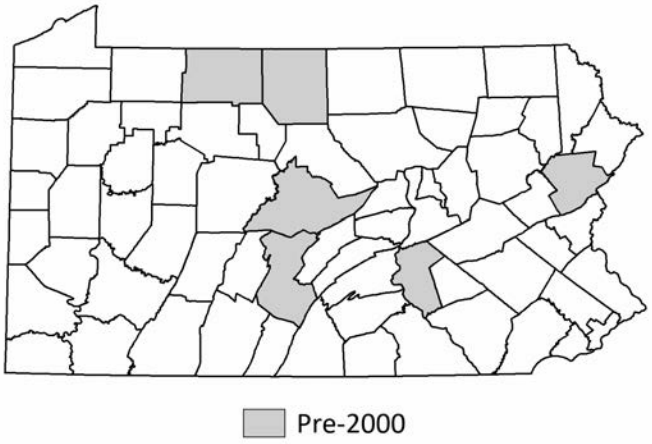
Nixe rusticalis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Mid-size, cold streams to large warm rivers

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for mayflies and other aquatic organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for stream organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** conservation plan created

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic species

Season: Year-round

Priority	Need	Partners
1	Habitat and threats	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

Hoover, Gregory A. Biodiversity of Mayflies (Ephemeroptera) of Pennsylvania. The Pennsylvania State University, Department of Entomology, University Park, PA

Mayfly Central (website)

PENNSYLVANIA
WILDLIFE ACTION PLAN

A stonefly

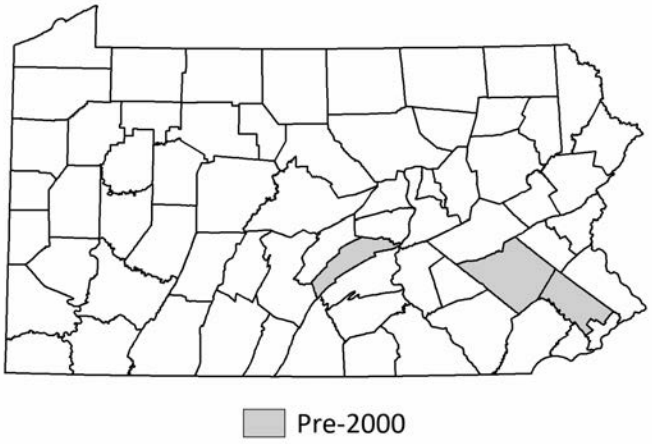
Acroneuria arenosa

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Medium to large limestone creeks and river, warm water.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Low

Specific Threat: Runoff from agricultural fields nearby occurrence

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for agricultural impacts to water quality and habitat

Objective: Improve water quality and habitats

Action Priority: **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Non-governmental organizations, Pennsylvania Fish and Boat Commission, Pennsylvania Association of Conservation Districts

Locations: HUC8 Watershed: Lower Juniata, Schuylkill

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Spatulate Snowfly

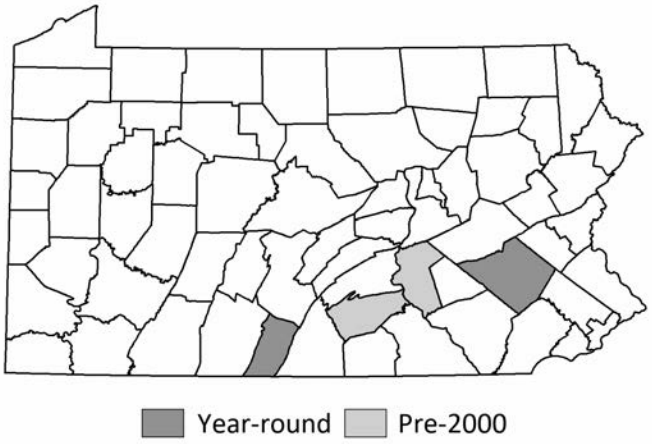
Allocapnia simmonsi

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Medium, warm, limestone creeks.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Intensive agriculture

Action Category: Manage non-living habitat components

Specific Action: Mitigate poor water quality and habitat from agriculture with BMPs

Objective: Improve water quality and habitat

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts

Locations: HUC8 Watershed: Conococheague-Opequon, Lower Susquehanna-Swatara, Schuylkill

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Dusky Sallfly

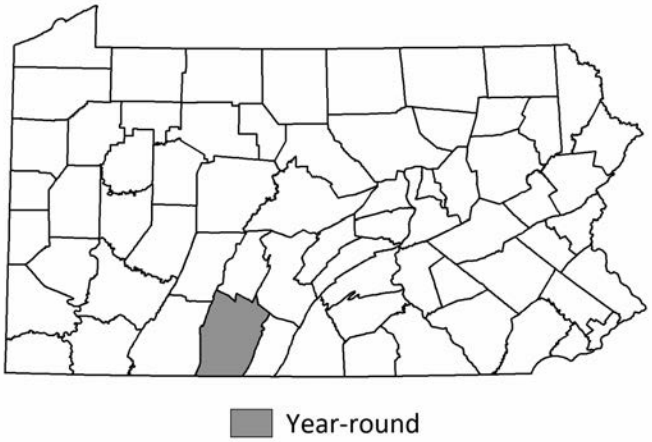
Alloperla biserrata

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Small, cold, forested headwater creeks.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Temperature Extremes **Threat Impact:** Medium

Specific Threat: Altered temperatures

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Duckhead Sallfly

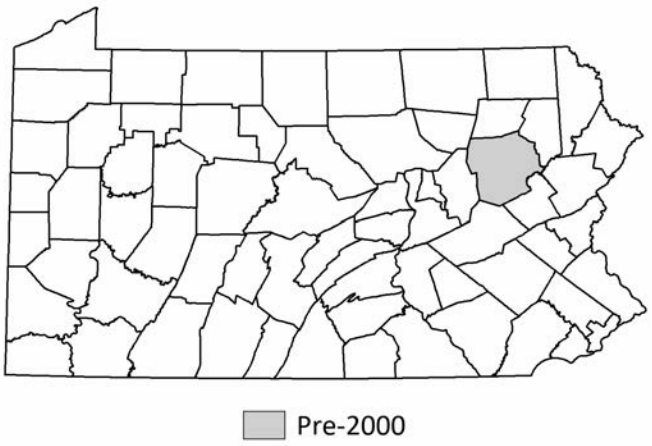
Alloperla concolor

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Small, cold, forested creeks.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Scotia Sallfly

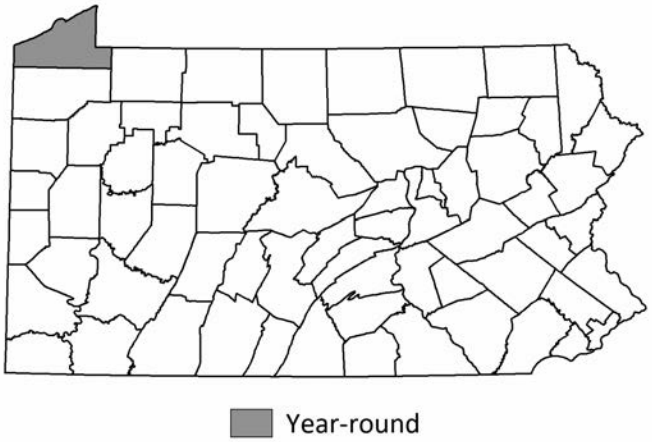
Alloperla vostoki

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Small creeks.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Appalachian Stone

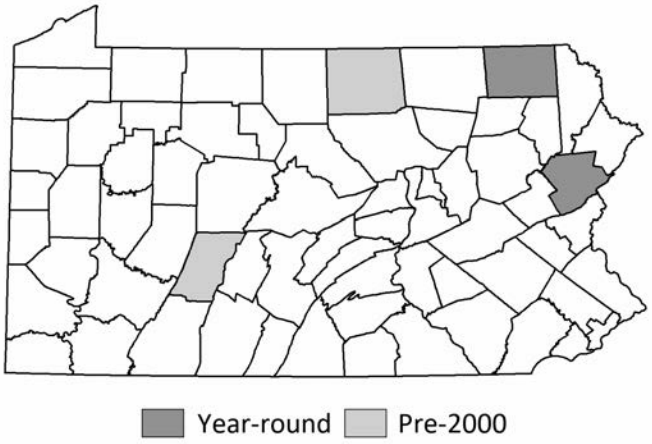
Hansonoperla appalachia

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Small to medium, cold, acidic creeks.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Development/ski resort nr Sand Spring Run

Action Category: Basic research and status monitoring

Specific Action: Monitor stream conditions at the site

Objective: Gather information on the issue to make informed decisions of potential next steps

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators:

Locations: HUC8 Watershed: Mid. Delaware-Mongaup-Brodhead

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Shenandoah Needlefly

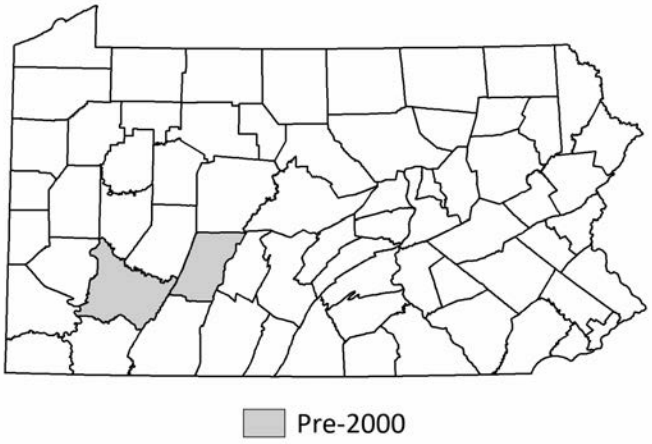
Megaleuctra flinti

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G2G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Springs and seeps.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Low

Specific Threat: Abandoned Mine Drainage (AMD), metals, pH

Action Category: Manage non-living habitat components

Specific Action: Implement remediation for mine drainage (very low pH and metals)

Objective: Implement remediation for mine drainage (very low pH and metals)

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators:

Locations: HUC8 Watershed: Conemaugh, Youghiogheny

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Three-spined Forestfly

Nemoura arctica

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Low gradient creeks, springs.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Non-governmental organizations, Universities & research institutions, Pennsylvania Fish and Boat Commission

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	Surveys to better describe distribution, abundance and habitat parameters	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Choctaw Stone

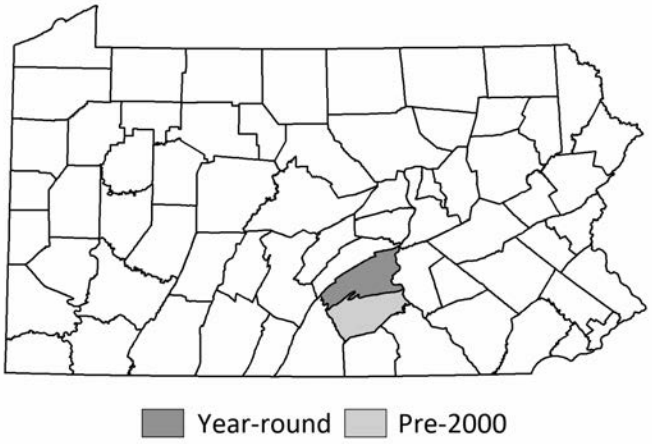
Neoperla choctaw

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Large, warm, creeks and rivers.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Domestic and Urban Waste Water

Threat Impact: Medium

Specific Threat: Run off from roads and other impervious surfaces

Action Category: Manage non-living habitat components

Specific Action: Mitigate runoff and habitat alteration from development through BMPs

Objective: Improve water quality and habitat

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Non-governmental organizations, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts

Locations: HUC8 Watershed: Lower Susquehanna-Swatara

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Bent Forestfly

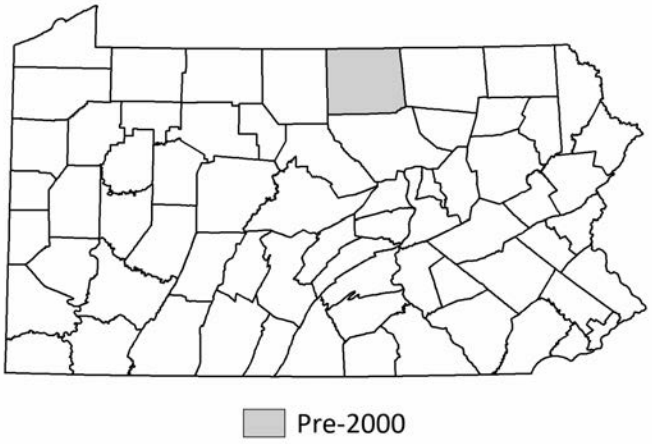
Ostrocerca prolongata

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Seeps and springs.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Logging and Wood Harvesting

Threat Impact: Low

Specific Threat: Logging in the watershed

Action Category: Basic research and status monitoring

Specific Action: Monitor stream conditions at the site

Objective: Gather information on the issue to make informed decisions of potential next steps

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators:

Locations: HUC8 Watershed: Pine

Other species likely to benefit from this action: Other aquatic species

Season: Year-round

Priority	Need	Partners
1	Collect habitat info to guide cons planning	

Season: Year-round

Priority	Survey	Partners
1	Threats to habitat and species	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Striped Stone

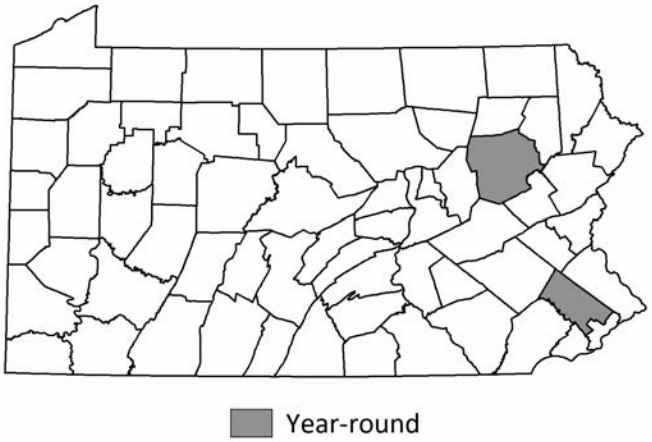
Perlinella drymo

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Small creeks.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other stoneflies and other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Collect habitat info to guide cons planning	

Season: Year-round

Priority	Survey	Partners
1	Threats to habitat and species	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Powdermill Forestfly

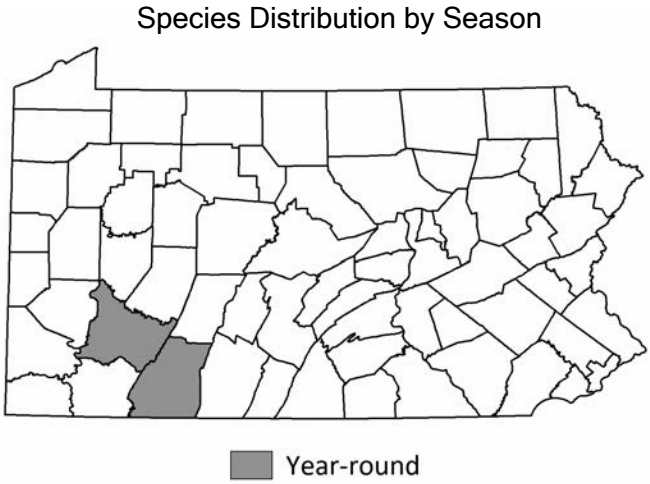
Soyedina merritti

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G2

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Seeps and springs.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Impaired watershed streams due to septic systems

Action Category: Outreach, communication and distribution

Specific Action: Conduct outreach with watershed landowners about septic system maintenance and potential leaks

Objective: Improve water quality

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of contacts reached, outreach events attended

Potential Collaborators:

Locations: HUC8 Watershed: Youghiogheny, Kiskiminetas, Conemaugh

Other species likely to benefit from this action: other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Shenandoah Sallfly

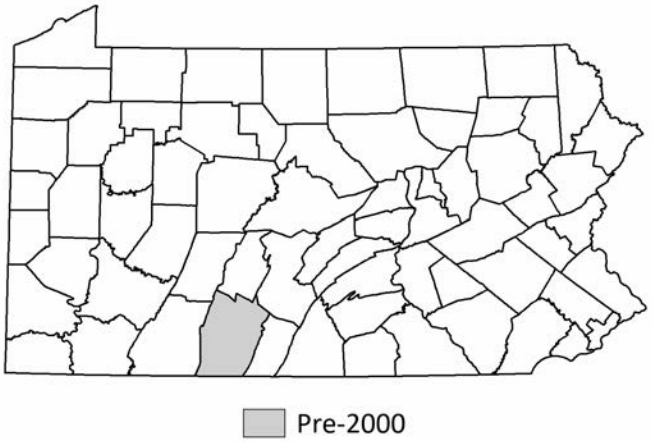
Sweltsa palearata

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G2G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Small, cold, forested headwater creeks.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Gaspe Sallfly

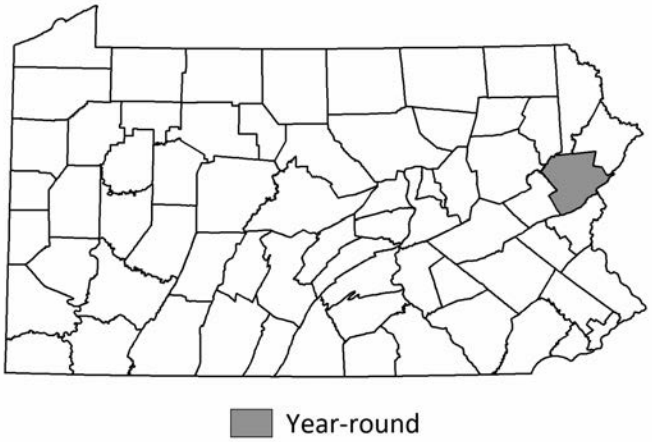
Utaperla gaspesiana

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Small, spring-fed creeks.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Storms and Flooding

Threat Impact: Medium - Low

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Universities & research institutions, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	Surveys to understand habitats and distribution	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Three-knobbed Snowfly

Allocapnia forbesi

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology from climate change

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: Other aquatic taxa

Season: Year-round

Priority	Need	Partners
1	studies of threats on habitats	

Season: Year-round

Priority	Survey	Partners
1	better understand the distribution and habitats	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Illinois Snowfly

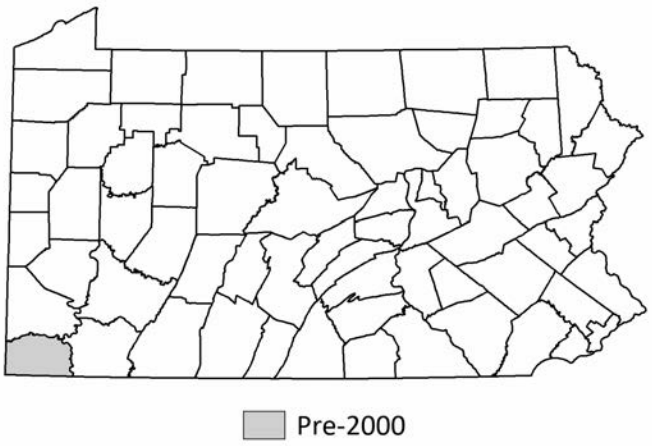
Allocapnia illinoensis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years.

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Small spring-fed streams

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Droughts **Threat Impact:** Unknown

Specific Threat: Altered hydrology from climate change

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Studies of threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	Surveys to better understand the distribution and habitats	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

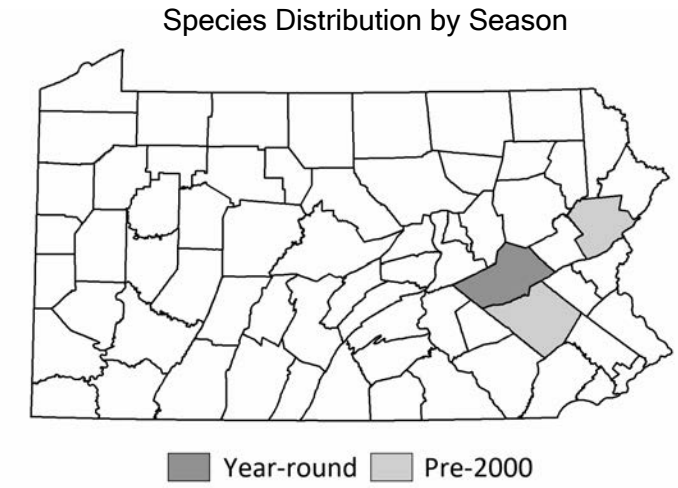
Appalachian Forestfly

Amphinemura appalachia

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Small cold creeks, acidic creeks

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Medium

Specific Threat: Sedimentation and pollution

Action Category: Manage non-living habitat components

Specific Action: Implement remediation for mine drainage (very low pH and metals)

Objective: Ameliorate water quality

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** water quality, habitat, IBI metrics

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Schuylkill, Lower Juniata

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Spiny Springfly

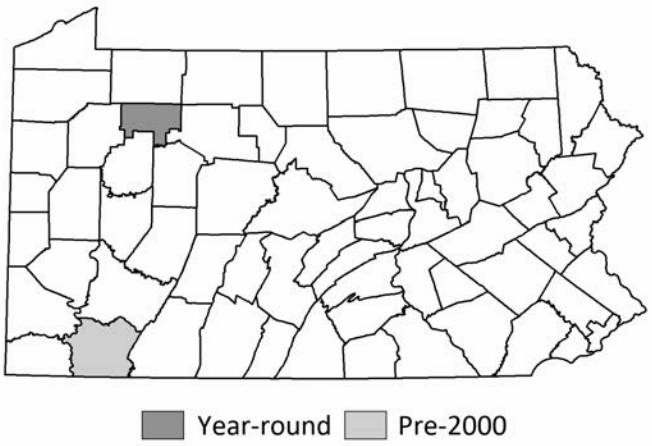
Cultus verticalis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Low

Specific Threat: Abandoned Mine Drainage (AMD) in Indian Cr watershed

Action Category: Manage non-living habitat components

Specific Action: Implement remediation for mine drainage (very low pH and metals)

Objective: Ameliorate water quality

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** water chemistry, substrate metrics, sedimentation

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts

Locations: HUC8 Watershed: Youghiogheny

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Atlantic Stone

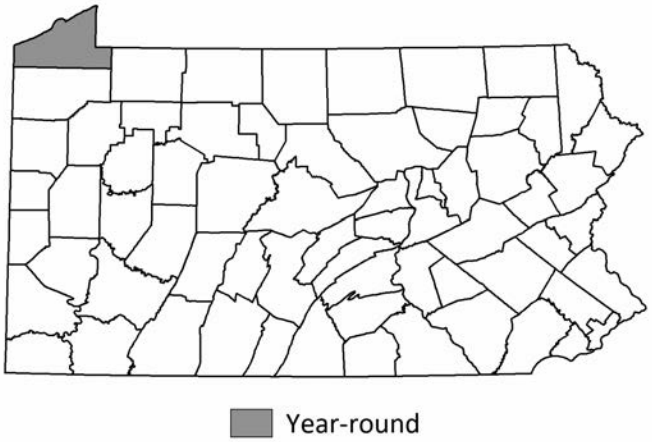
Neoperla occipitalis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Livestock Farming and Ranching

Threat Impact: Low

Specific Threat: Runoff and nutrient enrichment

Action Category: Manage non-living habitat components

Specific Action: Mitigate poor water quality and habitat from agriculture with BMPs

Objective: Improve water quality and habitat

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators:

Locations: HUC8 Watershed: Chautauqua-Conneaut, French

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Vermont Sallfly

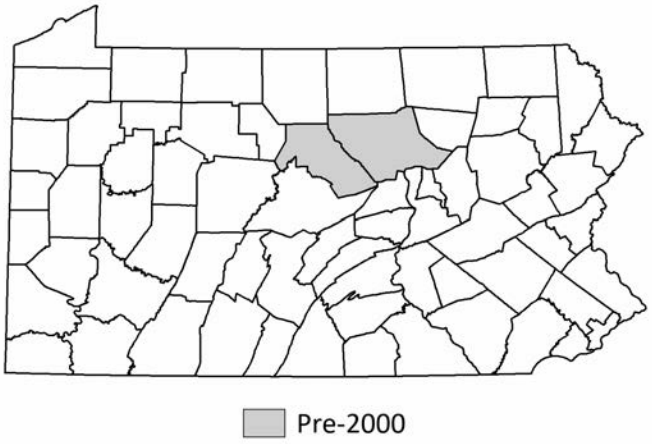
Rasvena terna

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology from climate change

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Pennsylvania Fish and Boat Commission, Non-governmental organizations, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic taxa

Season: Year-round

Priority	Need	Partners
1	Studies on threats to habitat	

Season: Year-round

Priority	Survey	Partners
1	Surveys to gather information on distribution and habitat	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Southeastern Forestfly

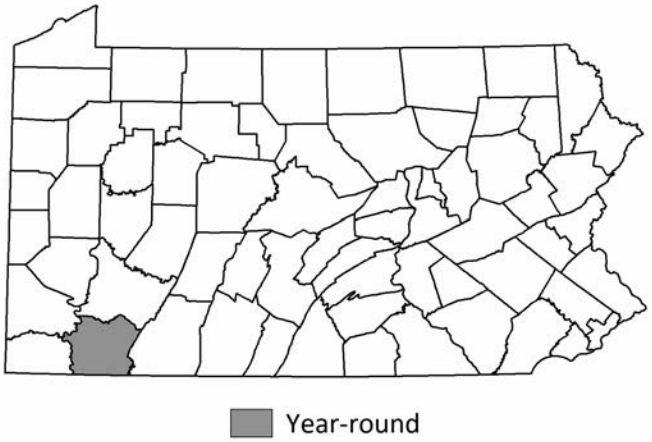
Soyedina kondratieffi

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Limestone spring runs

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology and low water levels

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators: Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Woodlands Sallfly

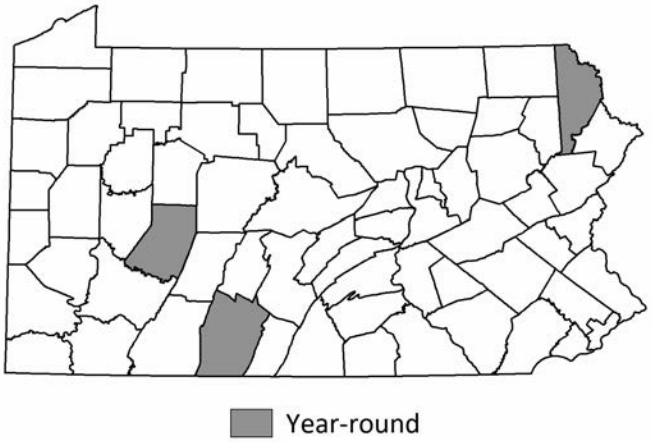
Alloperla petasata

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create a conservation plan for stoneflies and other organisms related to climate change concerns

Objective: Identify actions for mitigating climate change for aquatic organisms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** One conservation plan created

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: Other aquatic species

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Smoky Willowfly

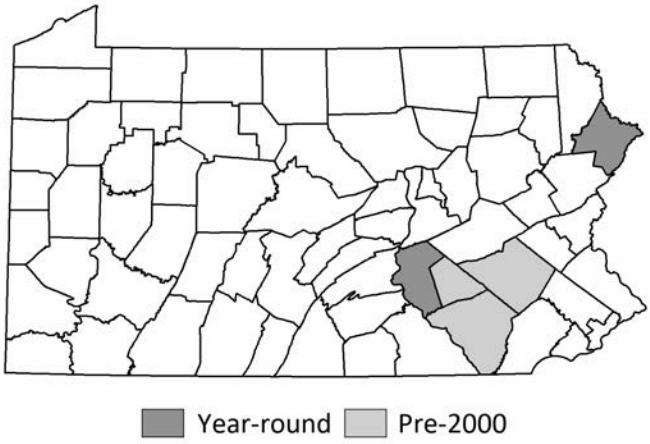
Bolotoperla rossi

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Small, cold high-gradient to medium warm-water creeks

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Low

Specific Threat: Conversion of natural areas to residential and other development

Action Category: Manage non-living habitat components

Specific Action: Mitigate runoff and habitat alteration from development through BMPs

Objective: Improve water quality and habitat

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts

Locations: HUC8 Watershed: Youghiogheny

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Great Lakes Springfly

Cultus decisus

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Cool, Medium River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Low

Specific Threat: Abandoned Mine Drainage (AMD) in Lick Run

Action Category: Manage non-living habitat components

Specific Action: Implement remediation for mine drainage (very low pH and metals)

Objective: Ameliorate water quality and habitat

Action Priority: **Action Urgency:** **Measure:** One conservation plan created

Potential Collaborators:

Locations: HUC8 Watershed: Pine

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Lash Springfly

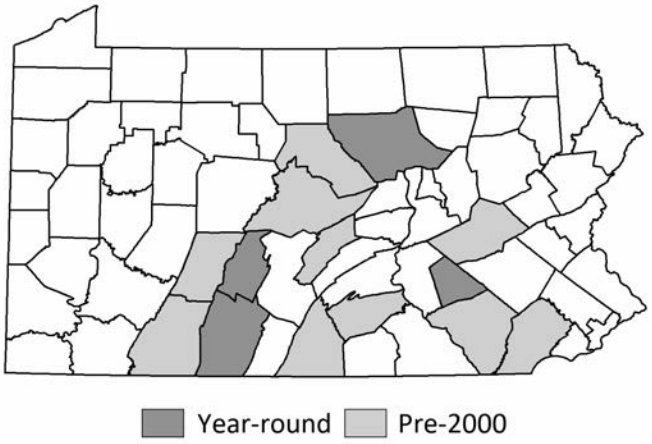
Remenus bilobatus

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year:

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Mining and Quarrying

Threat Impact: Medium

Specific Threat: Poor water quality from mining effluents

Action Category: Manage non-living habitat components

Specific Action: Implement remediation for mine drainage (very low pH and metals)

Objective: Improve water quality and habitat

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts

Locations: HUC8 Watershed: Mid. W. Br. Susquehanna, U. Juniata, Lower Susquehanna-Swatara, Schuylkill, Cacapon-Town, Conemaugh, Brandywine-Christina

Other species likely to benefit from this action: other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	Distribution and abundance	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Treat's Collared Ant

Aphaenogaster treatae

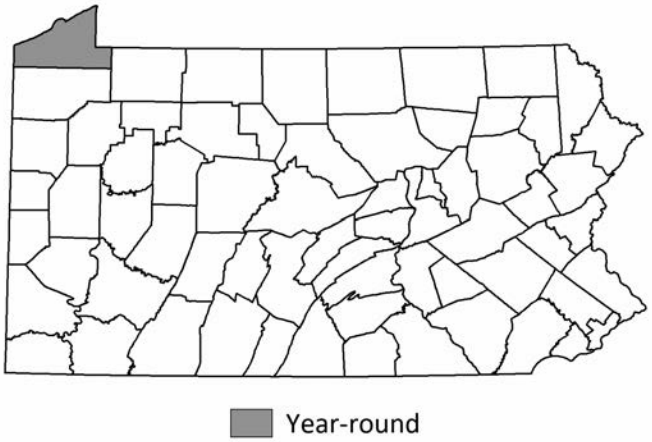
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Nobile

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open sandy habitats

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Low

Specific Threat: Succession of open sand barrens to woodland or forest

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open up woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Area restored and condition of land.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

Season: Year-round

Priority	Survey	Partners
4	Surveys are needed to understand the distribution of this species within Presque Isle	Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Yellow-banded Bumble Bee

Bombus terricola

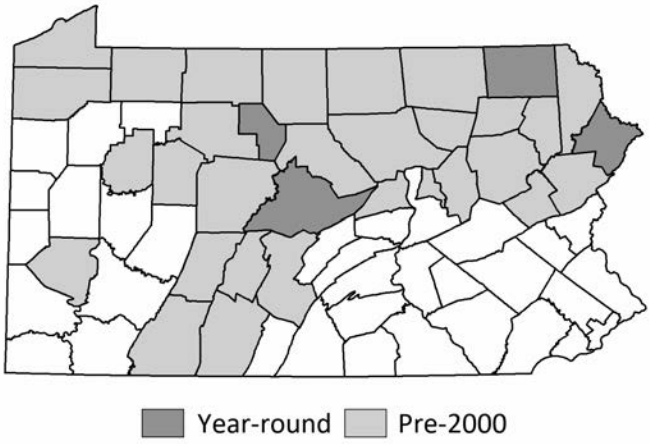
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G3G4

IUCN Red List Designation: Vulnerable

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Mostly open habitats and edges

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM). The choice of whether to use neonicotinoid-treated seed should be guided by IPM principles.

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following see SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

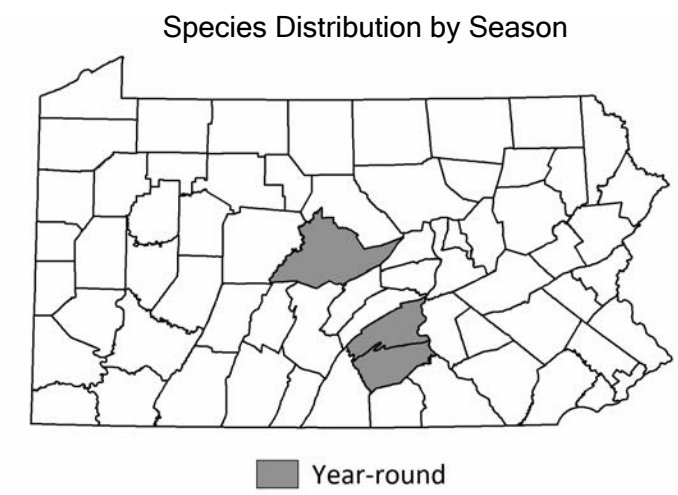
Indiscriminate Cuckoo Bumble Bee

Bombus insularis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This bee uses a variety of open and wooded habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Provide technical expertise to help legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Northern Amber Bumble Bee

Bombus borealis

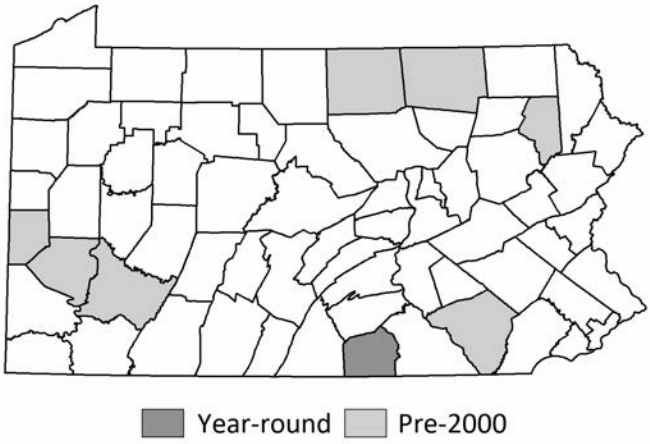
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. J

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our understanding of the distribution of this species by inventorying bumblebees across Pennsylvania.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: open meadows, fields, and edges.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Total amount of neonicotinoid pesticides applied annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Lemon Cuckoo Bumble Bee

Bombus citrinus

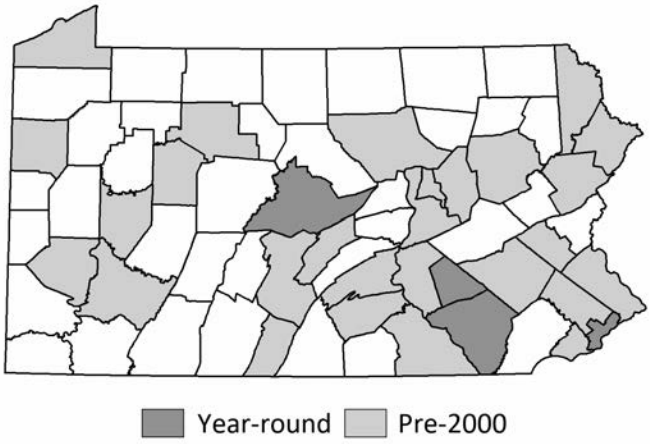
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Butler

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-70%

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: This generalist bee uses a variety of open and wooded habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Provide technical expertise to help legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

American Bumble Bee

Bombus pensylvanicus

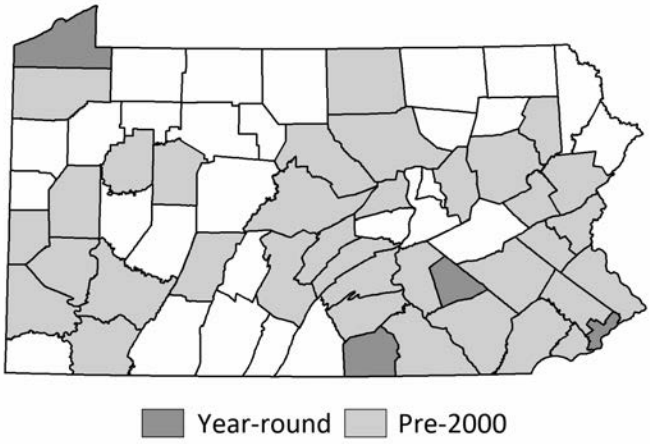
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Keim

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain populations at current levels through 2035.

NatureServe Global Rank: G3G4

IUCN Red List Designation: Vulnerable

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: This bee is a generalist of open to shrubby habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Provide technical expertise to help legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Red-belted Bumble Bee

Bombus rufocinctus

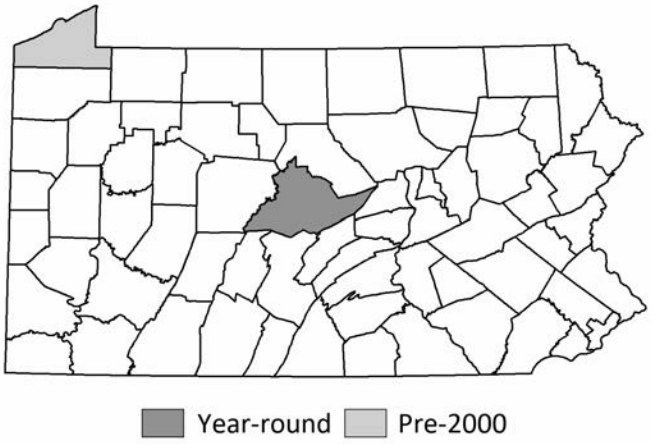
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our understanding of the distribution of this species

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Open and forested habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Provide technical expertise to help legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Black-headed Ash Sawfly

Tethida barda

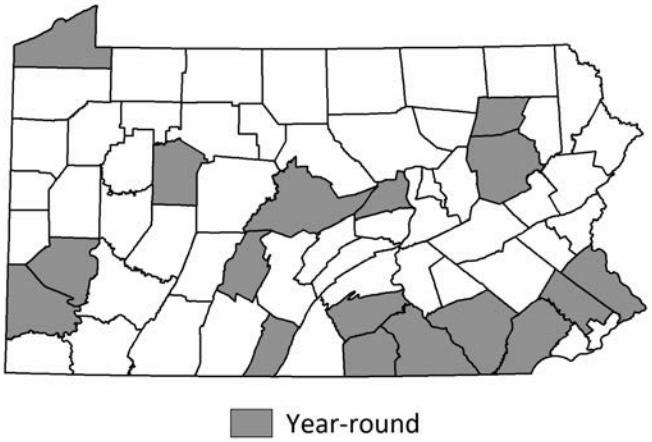
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species from Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-80%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Uses white ash (Fraxinus americana)

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, presumably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

American Sand Wasp

Bembix americana

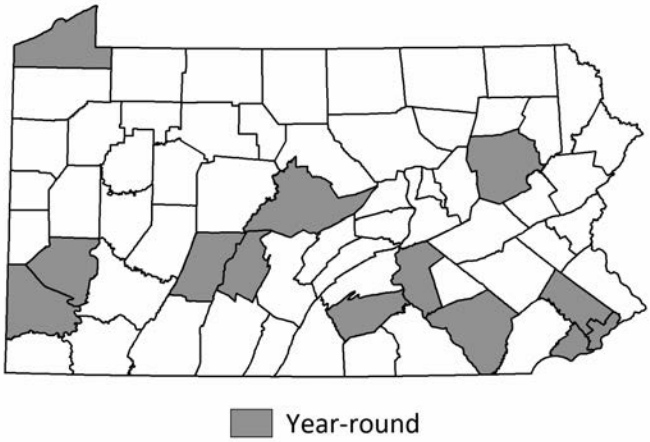
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open loose sand

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Recreational Activities **Threat Impact:** Low

Specific Threat: Regarding the Presque Isle and Walnut Creek Beach populations, as visitation continues to increase, disturbance of nests in open sandy areas is likely to increase. In eastern PA populations, the impact of this threat is unknown.

Action Category: Other legal actions

Specific Action: Maintain policies of keeping people off Piping Plover habitat (ie, Gull Point) during the breeding season. This will protect other sand barren specialist species that are vulnerable to foot traffic.

Objective: Minimize effects of foot traffic on most parts of Gull Point.

Action Priority: **Action Urgency:** Initiate immediately **Measure:** Whether or not rules are in place to minimize foot traffic on Gull Point.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Recreational Activities **Threat Impact:** Low

Specific Threat: Regarding the Presque Isle and Walnut Creek Beach populations, as visitation continues to increase, disturbance of nests in open sandy areas is likely to increase. In eastern PA populations, the impact of this threat is unknown.

Action Category: Outreach, communication and distribution

Specific Action: Communicate to township supervisors the importance of the small patch of sand barren habitat at Walnut Creek Beach.

Objective: Identify staff who influence managment at the site; talk with them. Provide a written report. Repeat every 5 years.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Have township contacts been given an update within the last 5 years?

Potential Collaborators: Local agencies & municipalities

Locations: HUC10 Watershed: Sixmile Cr.-Frontal Lake Erie,

Other species likely to benefit from this action: Microbembex monodonta

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Five-spotted Spider Wasp

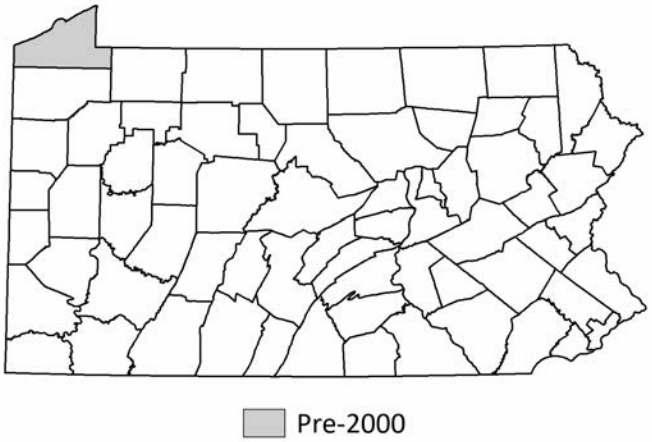
Episyron quinquenotatus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our knowledge of its distribution in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open sandy habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Recreational Activities **Threat Impact:** Low

Specific Threat: As visitation to Presque Isle continues to increase, disturbance of nests in open sandy areas is likely to increase.

Action Category: Other legal actions

Specific Action: Maintain policies of keeping people off Piping Plover habitat (ie, Gull Point) during the breeding season. This will protect other sand barren specialist species that are vulnerable to foot traffic.

Objective: Minimize effects of foot traffic on most parts of Gull Point.

Action Priority: **Action Urgency:** Initiate immediately **Measure:** Whether or not rules are in place to minimize foot traffic on Gull Point.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A chalcidid wasp

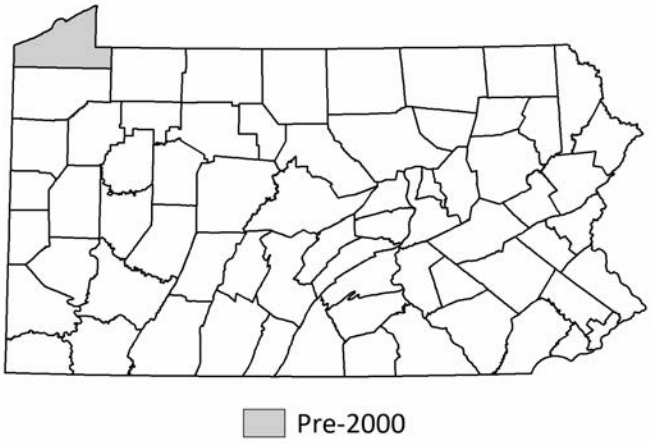
Hockeria eriensis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Open sandy habitat

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Recreational Activities **Threat Impact:** Low

Specific Threat: As visitation to Presque Isle continues to increase, disturbance of nests in open sandy areas is likely to increase.

Action Category:

Specific Action: Maintain policies of keeping people off Piping Plover habitat (ie, Gull Point) during the breeding season. This will protect other sand barren specialist species that are vulnerable to foot traffic.

Objective: Minimize effects of foot traffic on most parts of Gull Point.

Action Priority: **Action Urgency:** **Measure:** Occupancy of various stretches of beach

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

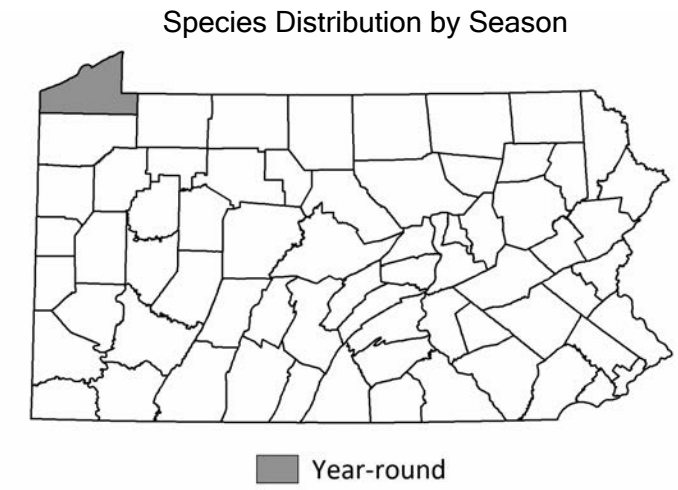
A sand wasp

Microbembex monodonta

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



P. Woods



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and improve our knowledge of the species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: open sandy habitat

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Recreational Activities **Threat Impact:** Low

Specific Threat: As visitation to Presque Isle continues to increase, disturbance of nests in open sandy areas is likely to increase.

Action Category: Other legal actions

Specific Action: Maintain policies of keeping people off Piping Plover habitat (ie, Gull Point) during the breeding season. This will protect other sand barren specialist species that are vulnerable to foot traffic.

Objective: Maintain policies of keeping people off Piping Plover habitat (ie, Gull Point) during the breeding season.

Action Priority: **Action Urgency:** Initiate immediately **Measure:** persistence of this species and other sand barren specialists at this site

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

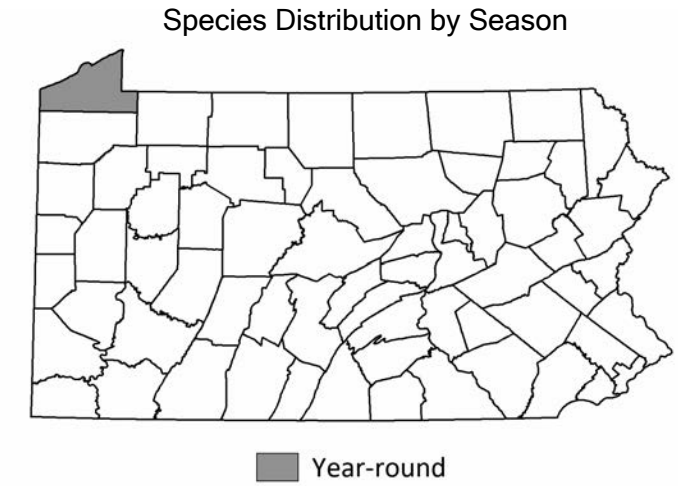
Bee Wolf

Philanthus politus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Very sandy soils with sparse vegetation.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** High - Medium

Specific Threat: Succession of the sand lot to denser vegetation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Encourage Springfield Township to maintain mowing schedule, and work with them to consider periodic disturbance to make small blowouts in the lawn.

Objective: Establish dialogue with Springfield Township staff about management.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** persistence of this and other species of interest at the site.

Potential Collaborators: Local agencies & municipalities, Private Landowners

Locations: Physiographic Section: Eastern Lake. HUC8 Watershed: Chautauqua-Conneaut

Other species likely to benefit from this action: a nomad cuckoo bee (Nomada superba) Racemed milkwort (Senega polygama) other bees and wasps

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Additional surveys for Hymenopterans and other sand barren specialists are warranted at this site.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Spiny Ash Sawfly

Eupareophora parca

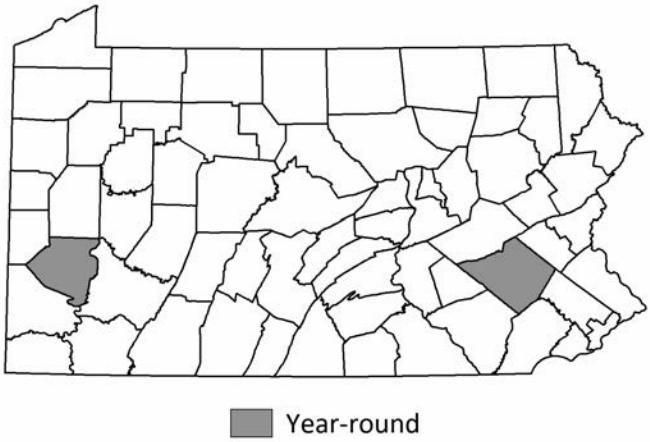
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



I. Farr

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species from Pennsyvlania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-70%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Uses ash trees (Fraxinus spp.)

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Ash seedlings are currently in good supply, but they are a finite and dwindling resource. Rate of sapling loss is uncertain, some may persist beyond the next decade.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A spider wasp

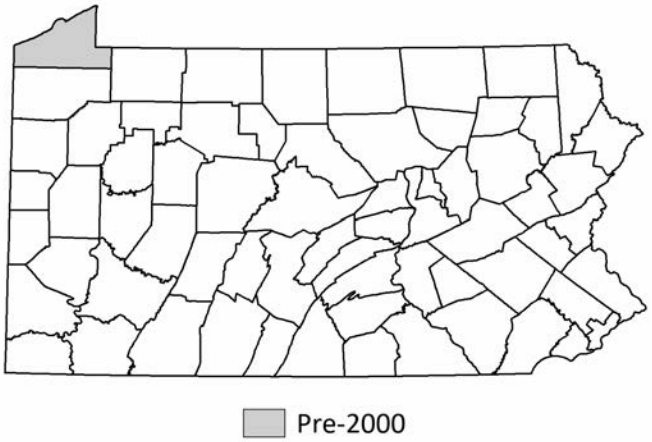
Anoplius apiculatus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Habitat, according to Kurczewski & Kiernan (2015) is "sandy soils near water courses, sand dunes, sand beaches, and inland sand blowouts." In PA, only known from Presque Isle. These wasps make nests in sandy soil, and nests could be destroyed by foot traffic.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Low

Specific Threat: Succession of open sand barrens to woodland or forest

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open up woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Area restored and condition of land.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

Season: Year-round

Priority	Survey	Partners
4	Surveys are needed to better understand the distribution of this species on Presque Isle, and other surveys along the Erie Coast are needed to determine if the species occurs elsewhere.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

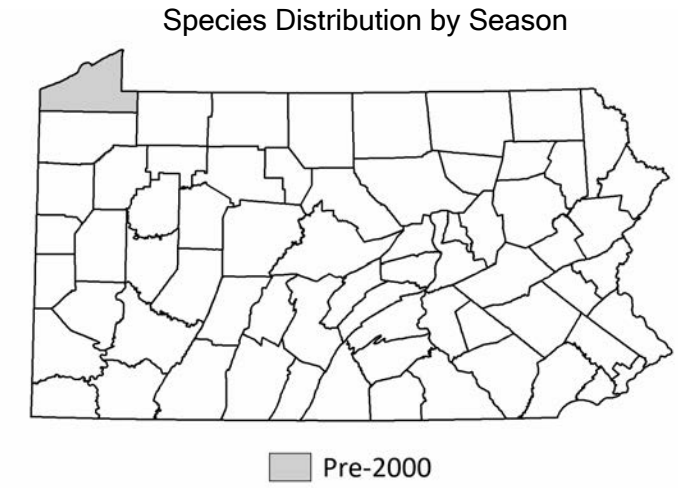
A spider wasp

Anoplius bengstssoni

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035, and survey for additional populations.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Habitat, according to Kurczewski & Kiernan (2015) is "behind beaches" at Presque Isle, probably meaning in and behind foredunes. Within PA, this species is known only from Presque Isle. This wasp provisions its nests with large spiders (perhaps limited to Geolycosa spp. and/or Arctosa spp., which are rare psammophilous genera), and the nests could be destroyed by foot traffic.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Low

Specific Threat: Succession of open sand barrens to woodland or forest

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open up woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Area restored and condition of land.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus).

No known research needs.

Season: Year-round

Priority	Survey	Partners
4	Surveys are needed to determine the distribution of this wasp within Presque Isle, and to determine if it might occur elsewhere along the Erie coast of PA.	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A spider wasp

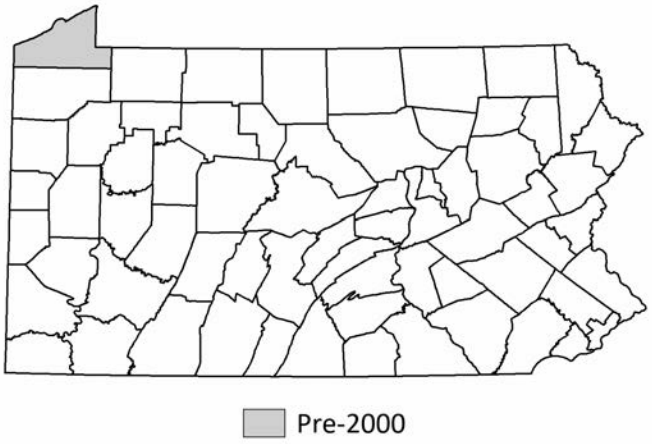
Anoplius cleora

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain population at current level through 2035, and survey for additional populations.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Habitat, according to Kurczewski & Kiernan (2015) is "bare sand beaches near water courses, especially sand beaches along Great Lakes." BugGuide says "open sandy areas often with little or no vegetation." Within PA, this species is known only from Presque Isle. The large sand-loving Beach Wolf Spider (Arctosa littoralis) is the main prey, or perhaps the only prey, that the wasp uses to provision the nests it digs into the sand.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Low

Specific Threat: Succession of open sand barrens to woodland or forest

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open up woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Area restored and condition of land.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys are needed to determine the distribution of this wasp on Presques Isle, and to determine if it occurs elsewhere on the Erie coast of PA.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A spider wasp

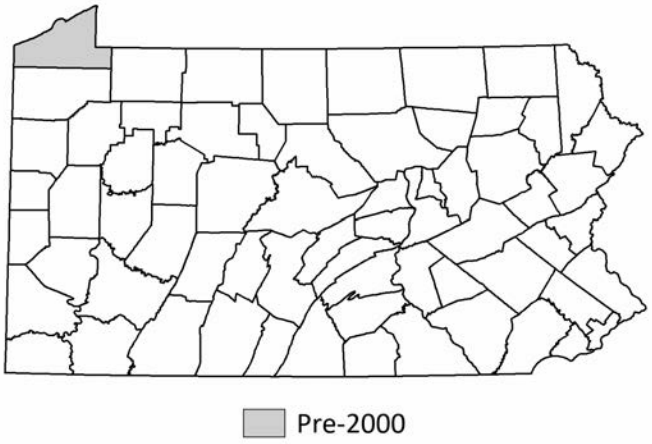
Anoplius cylindricus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035, and improve our understanding of the distribution of this species and its prey.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Habitat, according to Kurczewski & Kiernan (2015) is "sand dunes, sand plain, sand ridge, and inland sand blowout. This species is strongly psammophilous throughout its range." Within PA, this species is only known from Presque Isle. This wasp uses burrowing wolf spiders (Geolycosa spp.) to provision the nests it digs into the sand.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium

Specific Threat: Succession of open sand barrens to woodland or forest

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open up woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Area restored and condition of land.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys are needed to determine the distribution of this wasp and its prey (Geolycosa spp.) across Presque Isle.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A spider wasp

Arachnospila scelestus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035; survey for additional populations

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Kurczewski & Kiernan (2015) describe the habitat as "relict and degraded sand dunes, sand plain, shrub savanna, inland sand blowout, bare sand at deciduous woodland borders, and sandy openings in deciduous-coniferous woodland." Within Pennsylvania, Presque Isle is the only known site.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Low

Specific Threat: Succession of open sand barrens to woodland or forest

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open up woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Area restored and condition of land.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

Season: Year-round

Priority	Survey	Partners
4	Additional surveys are needed to determine the distribution and conservation needs of this species.	Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A spider wasp

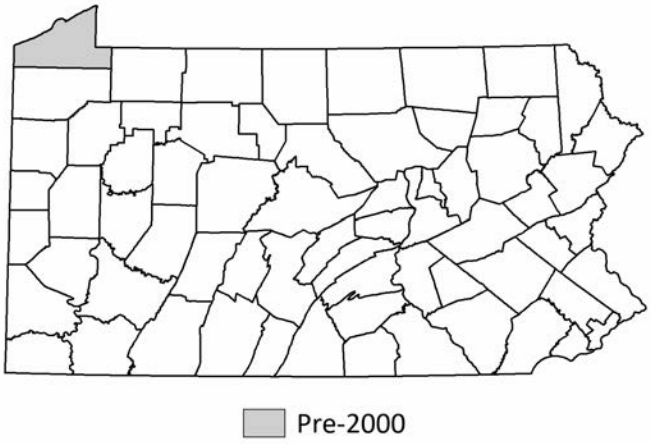
Anoplius splendens

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain the known population, and survey for additional populations.

NatureServe Global Rank: GNR

IUCN Red List Designation:

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Sandy soils near water courses, sand dunes, sand beaches, sand plain, and inland sand blowouts

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Low

Specific Threat: Succession of open sand barrens to woodland or forest

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open up woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Area restored and condition of land.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

Season: Year-round

Priority	Survey	Partners
4	Surveys are needed to understand the distribution of this species across Presque Isle.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

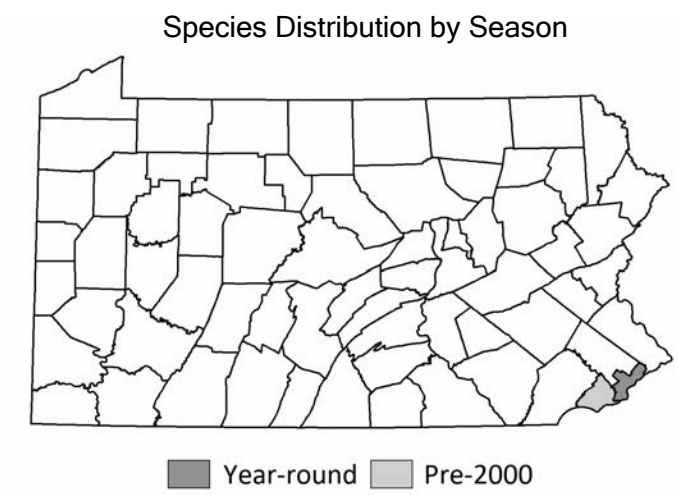
A yellow-faced bee

Hylaeus schwarzii

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: A pollen generalist, often found at the edges of marshes.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Utility and Service Lines

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

Survey Priorities

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

White-haired Golden Sweat Bee

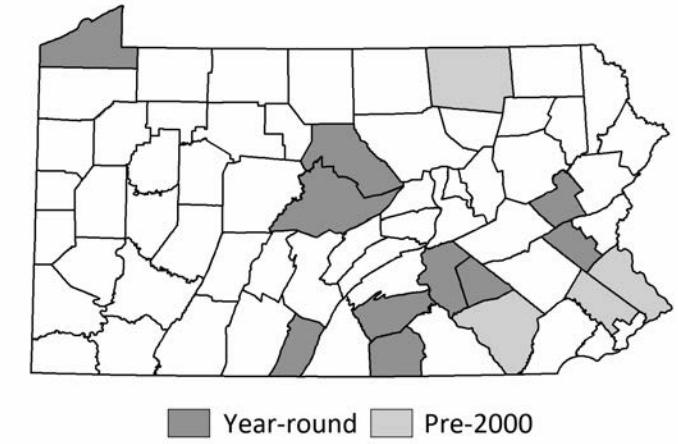
Lasioglossum leucocomum

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this bee by doing bee inventories focused on areas with sandy soils.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: open areas with sandy soils

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Felt's Mason Bee

Osmia felti

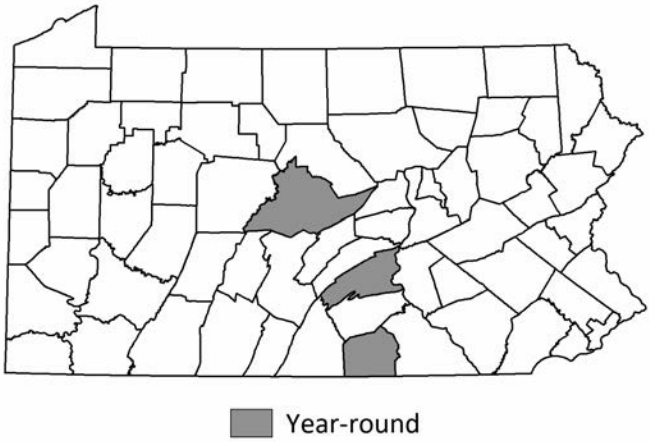
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Stabilize populations of species, which currently appears to be declining sharply. Improve our knowledge of the distribution of this species within Pennsylvania.

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Sandy barrens

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: All native Osmia spp in the region appear to be declining sharply after the introduction of exotic Osmia spp and the exotic chalkbrood fungi they carry.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Provide technical expertise to help legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

Season: Year-round

Priority	Need	Partners
1	To better understand the epidemic of chalkbrood fungus (Ascosphaera spp.), which was introduced along with exotic mason bees (Osmia spp.) and which now appears to be decimating our native mason bees. Possible research questions: - Are there some species of native Osmia, or some regions of the state, or some habitats, which are less susceptible to the fungus? - Is the spread of the fungus driven more by human-mediated movement of mason bees or by natural dispersal of the bees? - Are there interventions that could be applied to managed Osmia colonies to make them less likely to spread the fungus to native bees? - Are there less virulent fungus strains that could compete with the more virulent strains?	Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Trap-nesting surveys focused on mason bees (Osmia spp.) are urgently needed to better understand the rapidly changing status of our native mason bees. Surveys should be coordinated with the Pennsylvania Bee Monitoring Program.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Comments: The program has not yet done surveys focused on mason bees (Osmia spp.) but that could be a future focus of monitoring efforts.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Florida Little Carpenter Bee

Ceratina floridana

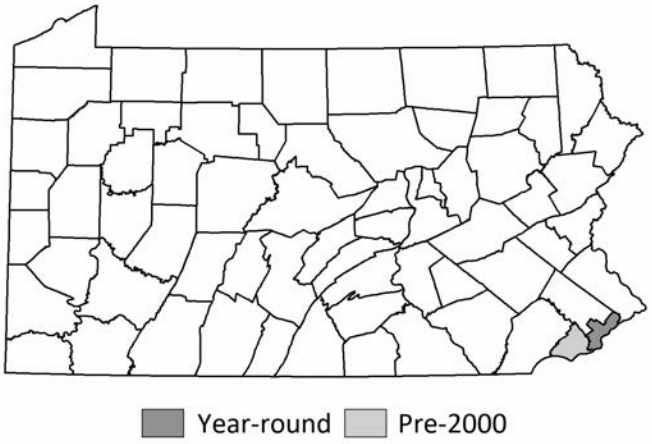
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Gibson

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our knowledge of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: open landscapes and edges

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** The amount of neonicontinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulens.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	General bee surveys are needed in the southeastern part of the state to better understand the status of this rarely collected generalist bee.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Alternate Cuckoo Leafcutter Bee

Coelioxys alternata

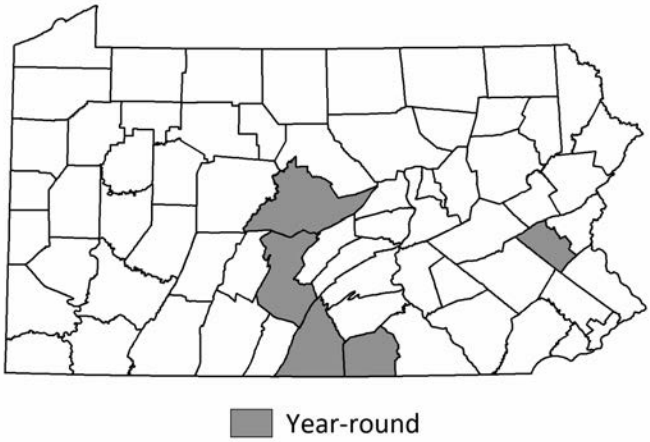
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Kiernan

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This bee is a kleptoparasite on leafcutter bees (Megachile spp.), which are mostly generalists of open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Physiographic Province: Ridge and Valley, Ridge and Valley, Ridge and Valley, Ridge and Valley. Physiographic Section: Great Valley, Appalachian Mountain, Great Valley, South Mountain

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Banks' Cuckoo Leafcutter Bee

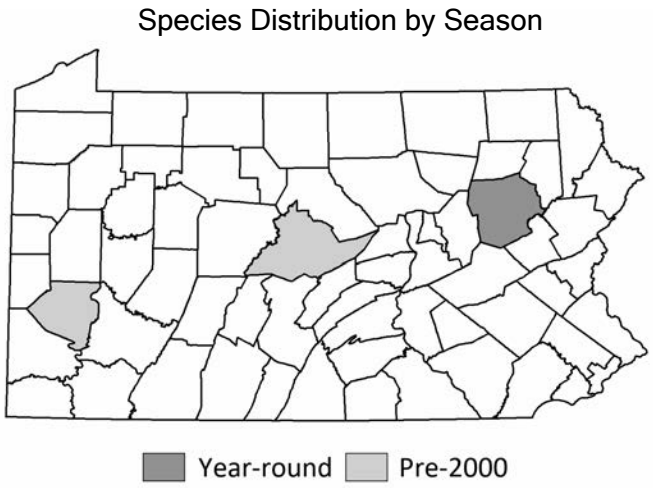
Coelioxys banksi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This bee in a kleptoparasite on leafcutter bees (Megachile spp.), which are mostly generalists of open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus, Ridge and Valley

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A leafcutter bee

Coelioxys hunteri

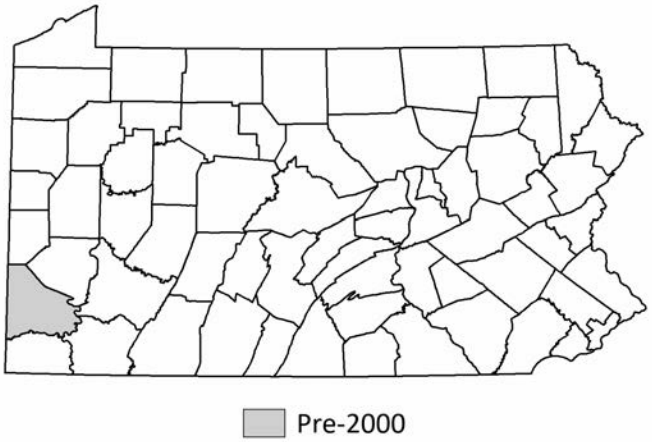
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Lucas

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This species is a kleptoparasite of leafcutter bees (Megachile spp.), which tend to be generalists of open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

Survey Priorities

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

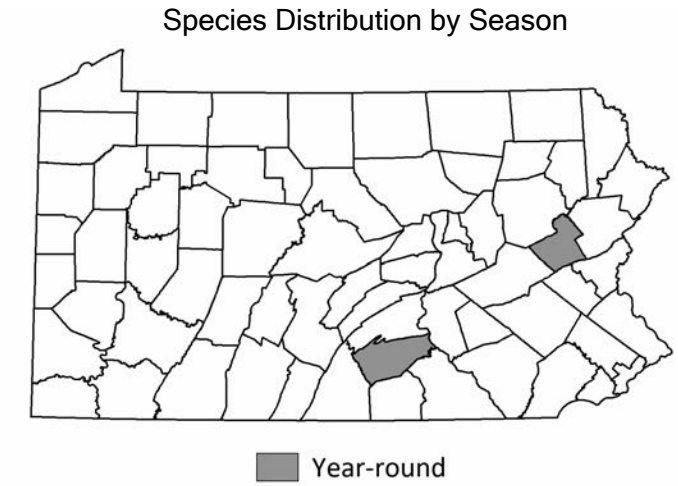
A leafcutter bee

Megachile ingenua

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: G2?

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: "Visits Lupinus and blueberry for nectar, and may be a specialist on Tephrosia for pollen (Krombein et al. 1979), all consistent with xeric sands. Moldenke (1979) associated it with visiting legumes in southern mixed forests." (NatureServe Explorer).

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Physiographic Province: Piedmont, Ridge and Valley

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A leafcutter bee

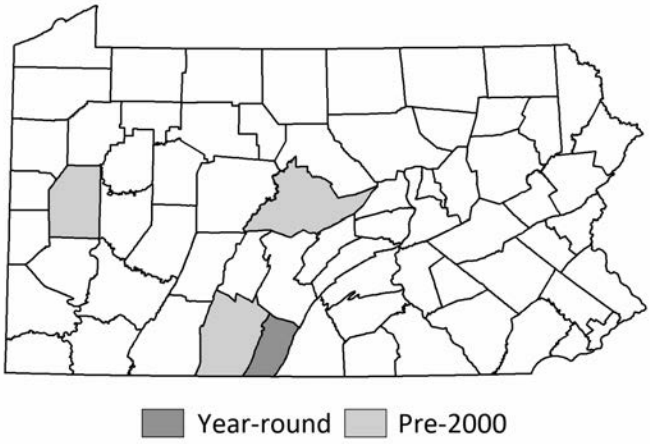
Paranthidium jugatorium

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Slopes in well-drained soils, in forest and edge habitats at higher elevations, with sunflowers (Helianthus spp.)

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, is vulnerable to neonicotinoid exposure.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Bee surveys focused on sunflowers (Helianthus spp.) and other plants in the sunflower family are needed to improve our knowledge of the distribution and status of this pollen-specialist bee.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A leafcutter bee

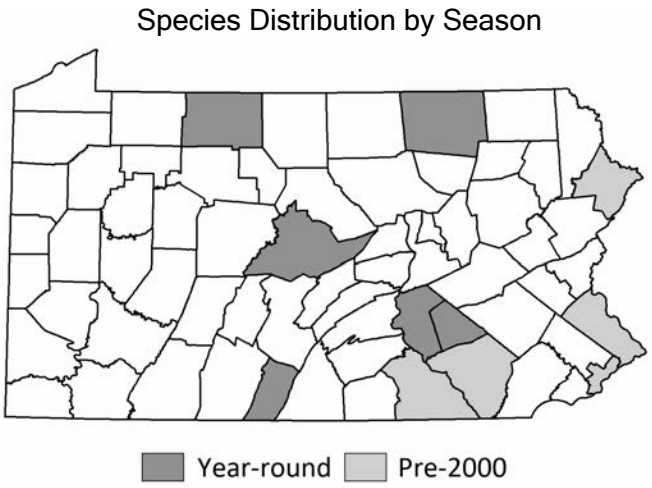
Hoplitis simplex

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Native Bee Inventory and Monitoring Laboratory



Conservation Profile

PA 10-Year Conservation Goal: Maintain this species at known sites, and continue to improve our understanding of the distribution of this species by inventorying bees on Miami mist (Phacelia purshii) and Appalachian phacelia (Phacelia dubia).

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on Phacelia spp. In Pennsylvania it would be limited to Miami Mist (Phacelia purshii), which grows in rich mesic soils in southwest PA, and Appalachian Phacelia (P. dubia), which grows on Shale barrens and outcrops along the lower Susquehanna River.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: South-Central Interior Mesophytic Forest

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plants of this specialist moth are particularly susceptible to invasive plants, which crowd the host plant out of its habitat. While the host plants may not be catastrophically impacted in the next ten years, but a slow and steady decline of host plants is expected in the absence of action.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Identify sites where Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) occur on state lands. Evaluate those sites for invasive plants, and use herbicide to control the plants in cases where they threaten the Phacelia species.

Objective: Evaluate 9 populations of Phacelia spp. on state lands, and actively manage all that are threatened by invasive plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Percent control of invasive species achieved at each site

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau, Allegheny Mountain, Allegheny Front, Appalachian Mountain, Great Valley, Gettysburg-Newark Lowland, Piedmont Lowland, Piedmont Upland

Other species likely to benefit from this action: The six SGCN that use Phacelia spp. would benefit; this includes 3 bees: Andrena phaceliae, Andrena lamelliterga, and Hoplitis simplex; and 3 moths: Tinagma gaedikei, Ethmia zelleriella, and Ethmia macelhosiella. Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) would also benefit.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Determine which populations of Phacelia spp. support which of the 6 specialist insects. Most of those insects can be surveyed while the host plants are in bloom (mid- to late May). The moth Ethmia macelhosiella may require a black light survey in October/November. Surveys could be performed by the PA Bee Monitoring Project, WPC, or other qualified individuals.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A leafcutter bee

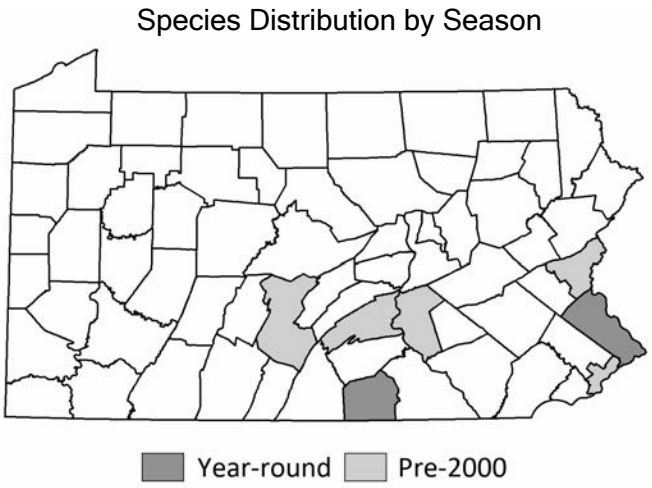
Megachile integra

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by inventorying bees on patches of Strophostyles.

NatureServe Global Rank: G2G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This bee is a pollen specialist on wild bean (Strophystyles spp.) Galactia is also reportedly used, but the only species is S1 in PA, so Galactia is probably not a significant host here.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium

Specific Threat: Suppression of fire and other disturbances results in succession of open sandy habitats to shrubland and forest, which excludes trailing wild bean (Strophostyles helvola), the main host of this bee in Pennsylvania.

Action Category: Manage non-living habitat components

Specific Action: Introduce disturbance in sandy sites occupied by the bee, so that trailing fuzzy bean (Strophostyles helvola) or other Strophostyles can spread. Disturbance could be in the form or fire, or mechanical or chemical removal of vegetation.

Objective: Evaluate sites with known populations of the bee (5 at the time of this writing), to determine what host plants the bee is using and whether disturbance of sandy soils would improve sandy habitat needed by the bee or host plant. Work with landowners to develop and implement management plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites managed, area of disrupted vegetation.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: Ridge and Valley, Piedmont

Other species likely to benefit from this action: Opening up sites with lots of sand could benefit a number of SGCN

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A leafcutter bee

Coelioxys immaculata

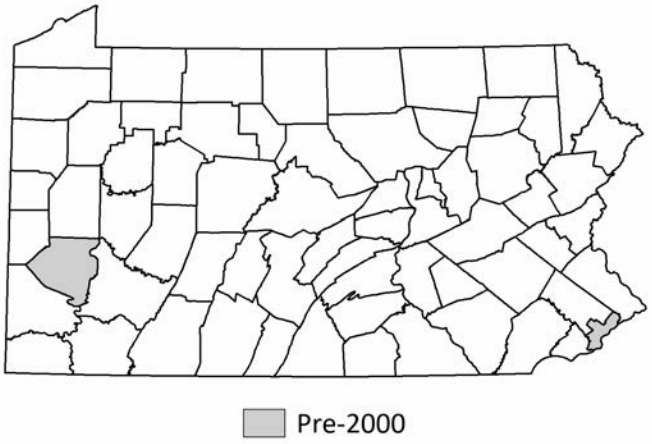
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populatios and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This bee is a brood parasite of the leafcutter bee Megachile addenda, and possibly other Megachile spp. M. addenda is a generalist that can be found in both wetlands and open uplands.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: This bee nests in both open uplands and wetlands. Both types of habitat are prone to invasion by introduced weeds that displace the native plants that this bee and its host rely on.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: At sites where this bee occurs, evaluate populations of the host bee's host plants (blueberry, cranberry, and others), and control invasive plants where they threaten the host plants.

Objective: At the time of this writing, a single extant population is known in Pennsylvania. That population, as well as any others that are found, should be evaluated for invasive plant threats and other threats, and those threats should be addressed.

Action Priority: 3-Medium **Action Urgency:** Can wait 10 years to initiate **Measure:** reduction of invasive plant coverage; persistence of the bee.

Potential Collaborators: Universities & research institutions

Locations: Physiographic Province: Ridge and Valley. Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Megachile addenda. The additional species that benefit will depend on the site.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Porter's Cuckoo Leafcutter Bee

Coelioxys porterae

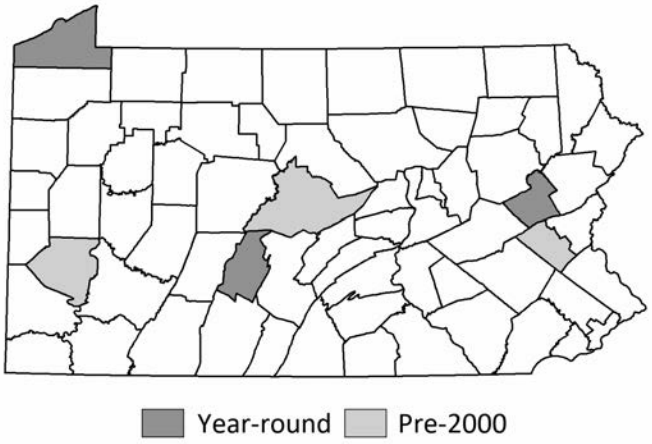
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Walsh

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A kleptoparasite of Megachile relative and M. frigida (and perhaps others), which are generalists of mostly open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A cellophane bee

Colletes eulophi

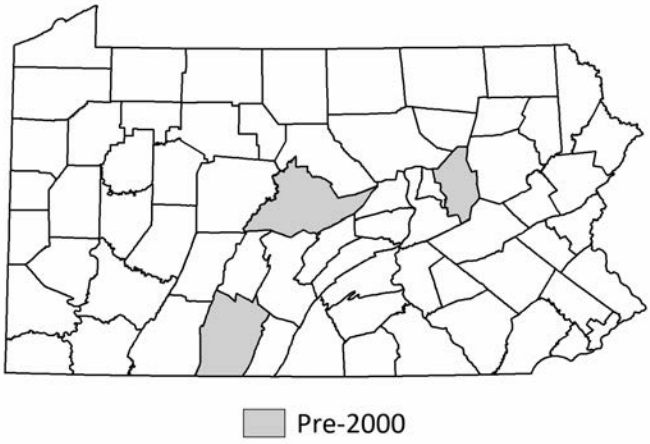
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Lambert

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: This bee uses a variety of flowers as sources of nectar and pollen, and nests in exposed soil

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Conversion of natural areas to residential and other development generally reduces the availability of a wide variety of pollen and nectar sources. Oligolectic and monlectic bee species, such as this one, can be strongly affected by decline of a single genus or species of host plant. This genus of bee in particular has been negatively associated with urbanization (Quinlan et al, 2023). Pesticides used in residential landscaping can be a serious threat to native bees in these settings.

Action Category: Outreach, communication and distribution

Specific Action: Reduce pesticide use in residential neighborhoods. These habitats can be a viable habitat for the Alumroot Cellophane Bee, if the host plant is planted and if pesticides are not used.

Objective: Educate gardeners about the risks of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** number of gardeners contacted

Potential Collaborators: Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: A wide variety of bees, butterflies, moths, other pollinators, and other insects.

No known research needs.

No known survey priorities.

No known monitoring programs.

References

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A cellophane bee

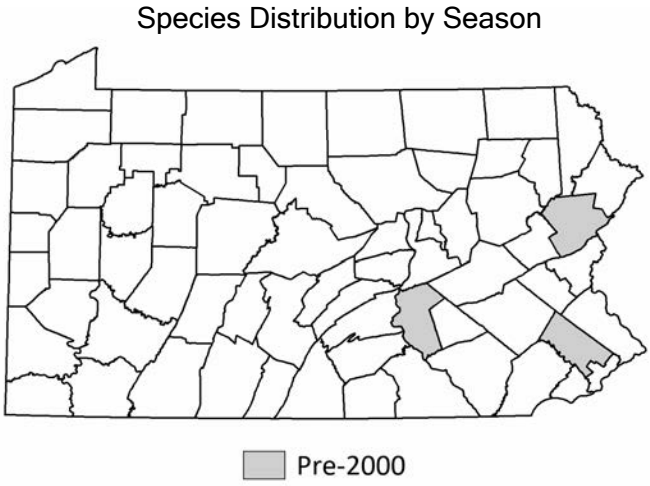
Colletes aestivalis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Willhelm



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on alumroot (Heuchera spp.)

Primary Habitat: Open Upland

Primary Habitat Type: Cliff & Talus

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Conversion of natural areas to residential and other development generally reduces the availability of a wide variety of pollen and nectar sources. Oligolectic and monlectic bee species, such as this one, can be strongly affected by decline of a single genus or species of host plant. This genus of bee in particular has been negatively associated with urbanization (Quinlan et al, 2023). Pesticides used in residential landscaping can be a serious threat to native bees in these settings.

Action Category: Outreach, communication and distribution

Specific Action: Reduce pesticide use in residential neighborhoods. These habitats can be a viable habitat for the Alumroot Cellophane Bee, if the host plant is planted and if pesticides are not used.

Objective: Educate gardeners about the risks of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** number of gardeners contacted

Potential Collaborators: Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: A wide variety of bees, butterflies, moths, other pollinators, and other insects.

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Conversion of natural areas to residential and other development generally reduces the availability of a wide variety of pollen and nectar sources. Oligolectic and monlectic bee species, such as this one, can be strongly affected by decline of a single genus or species of host plant. This genus of bee in particular has been negatively associated with urbanization (Quinlan et al, 2023). Pesticides used in residential landscaping can be a serious threat to native bees in these settings.

Action Category: Outreach, communication and distribution

Specific Action: Encourage landowners to landscape with native plants. Heuchera americana and H. alba both grow well in a garden setting, and can support populations of the Alumroot Cellophane Bee.

Objective: Educate gardeners about the benefits of using native plants, including native Heuchera spp.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** number of gardeners contacted

Potential Collaborators: Businesses, Pennsylvania Association of Conservation Districts, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: A wide variety of native pollinators and herbivores would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A cellophane bee

Colletes productus

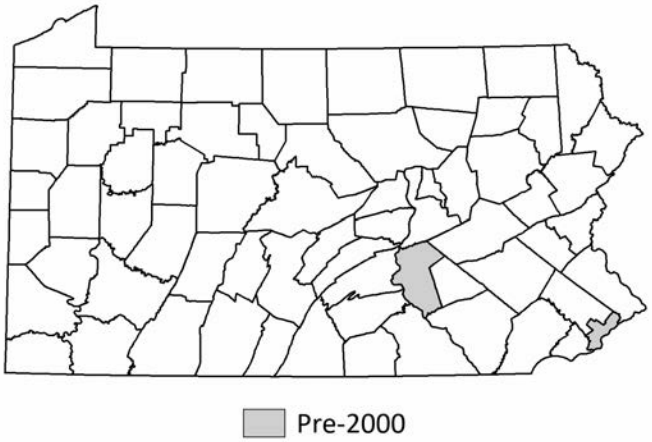
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species still persists within Pennsyvlania, by surveying bees at Lyonia and Vaccinium populations.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on maleberry (Lyonia spp.) and blueberry (Vaccinium spp.)

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Fire suppression resulting in canopy closure and reduction in heaths.

Action Category: Manage non-living habitat components

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality and allow recolonization of sensitive species.

Objective: Many insects use early successional habitats like meadows, grasslands, and barrens that require periodic disturbance to keep them open. Some of these species have eggs, larva, and pupae that are especially vulnerable to fire. Conduct baseline inventories to determine where these species occur. Develop and update management plans to include best practices that reduce negative impacts to fire sensitive species. Use prescribed fire and/or mowing to maintain a mosaic of vegetation structure that includes woodlands, shrublands, and low grassy/forb openings. Define the core habitat for each species of concern based on the habitat subtypes and host plants they utilize. Burn or mow no more than a quarter of their core habitats in a year. Delineate and protect sections of core habitat as refugia during management. Make some management units permanent fire refugia, where fire is never deliberately applied. Expand the core habitat by restoring adjacent areas that have succeeded into forest.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of prescribed burn plans written, which specifically incorporated the needs of invertebrate SGCN.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A long-horned bee

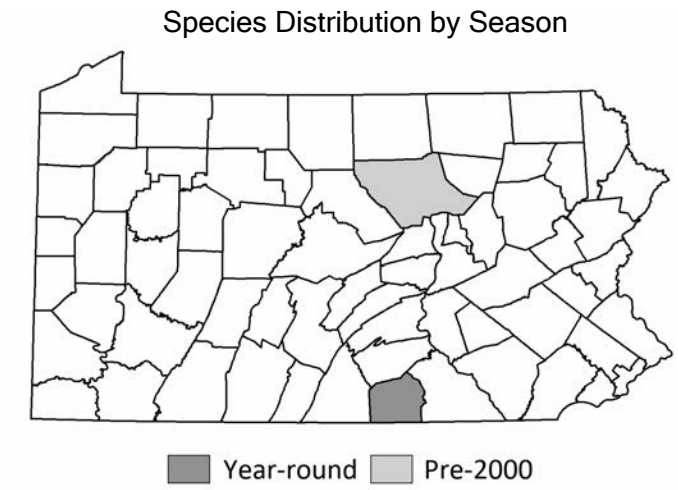
Eucera dubitata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Willhelm



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations of the bee through 2035, and improve our knowledge of the distribution of this species, by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open to forested habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Conversion of natural areas to residential and other development generally reduces the availability of a wide variety of pollen and nectar sources. Oligolectic and monlectic bee species, such as this one, can be strongly affected by decline of a single genus or species of host plant. This genus of bee in particular has been negatively associated with urbanization (Quinlan et al, 2023). Pesticides used in residential landscaping can be a serious threat to native bees in these settings.

Action Category: Outreach, communication and distribution

Specific Action: Reduce pesticide use in residential neighborhoods. These areas can be viable habitats for native bees if pesticides are not used.

Objective: Educate gardeners about the risks of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** **Measure:** number of gardeners contacted

Potential Collaborators: Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: A wide variety of bees, butterflies, moths, other pollinators, and other insects.

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

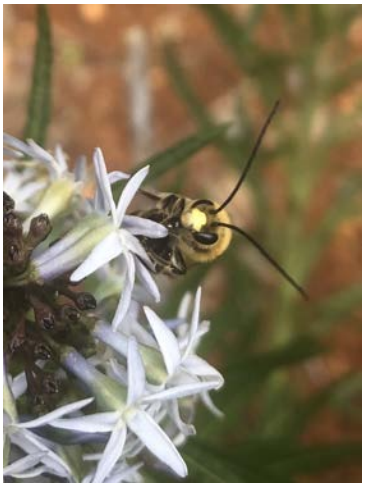
PENNSYLVANIA WILDLIFE ACTION PLAN

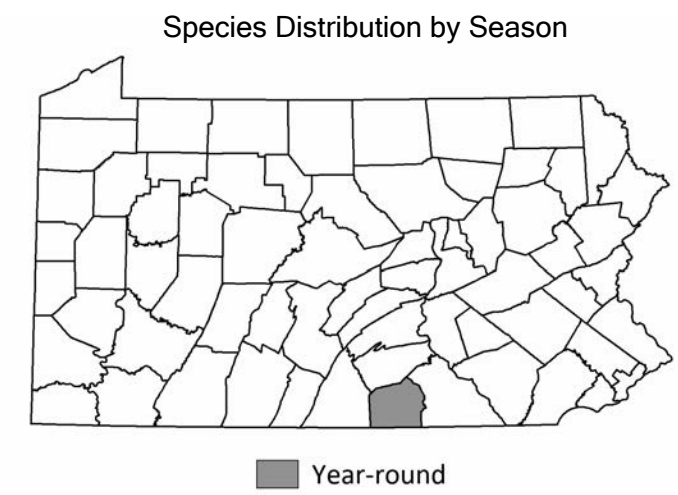
A long-horned bee

Eucera rosae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: a variety of open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A long-horned bee

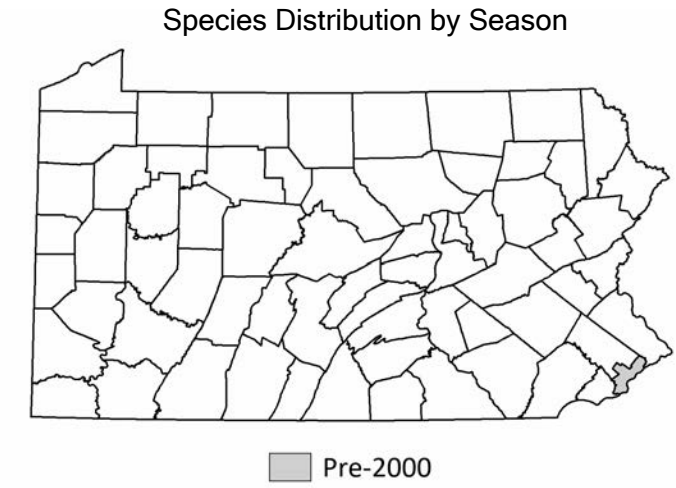
Svastra compta

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Wilhelm



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species still occurs in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: This species is a pollen specialist on evening primroses (Oenothera spp.), which grow in open disturbed areas.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM). The choice of whether to use neonicotinoid-treated seed should be guided by IPM principles.

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following see SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Dusty Cuckoo Nomad Bee

Holcopasites illinoiensis

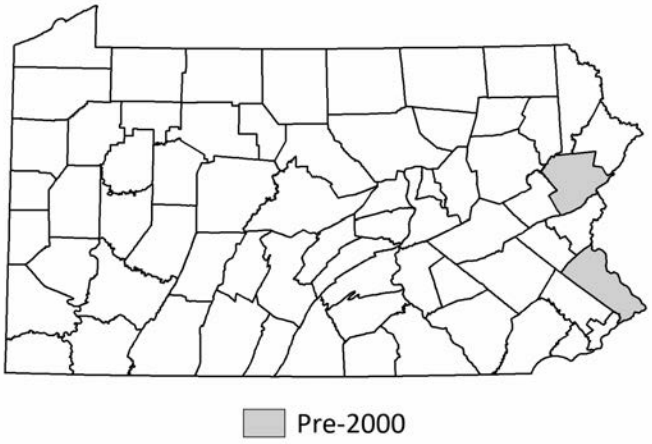
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Coulter

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: generally open habitats with a variety of floral resources.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority:

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

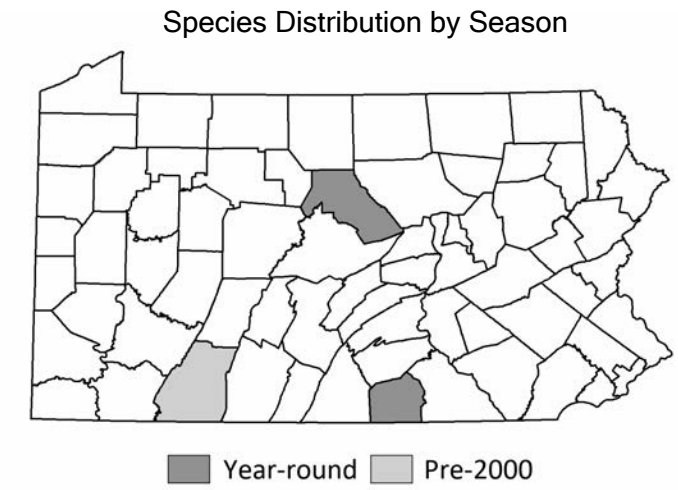
White-faced Summer Mason Bee

Hoplitis albifrons

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



L. Cass



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the distribution of this species,

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Mostly open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicontinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Physiographic Province: Ridge and Valley, Piedmont

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulens.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	General bee surveys across the state are needed to better understand the status of this rarely collected bee	

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A sweat bee

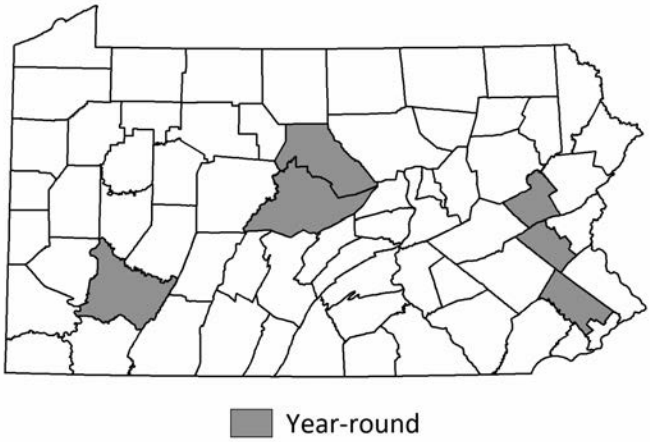
Lasioglossum apocyni

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: uses a variety of open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A sweat bee

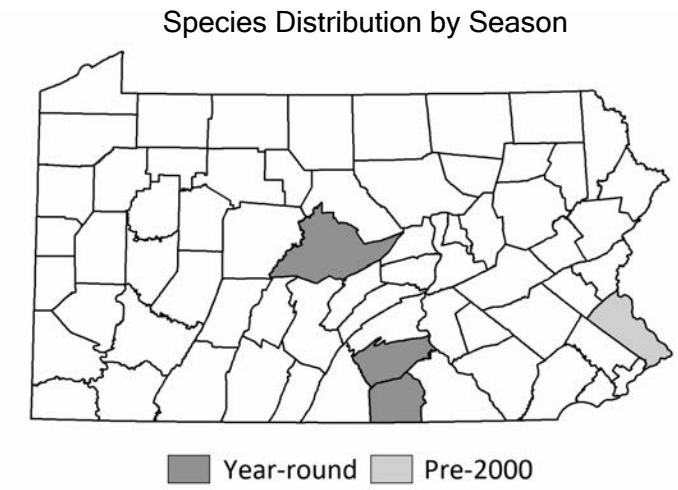
Lasioglossum cattellae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. McClay



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Forests and woodlands

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

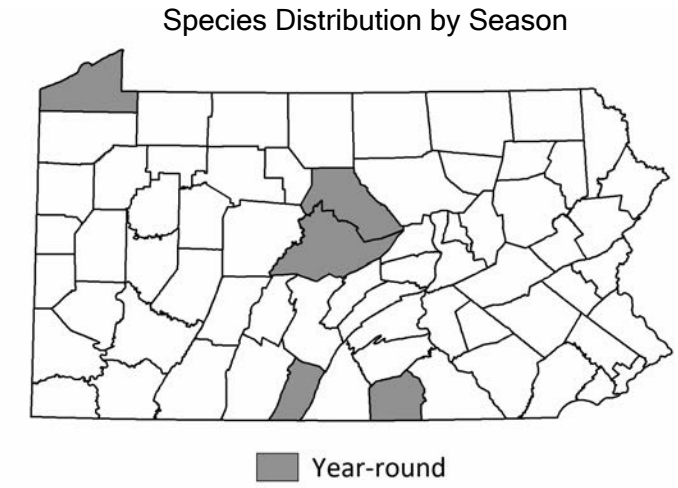
A sweat bee

Lasioglossum katherineae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: uses a variety of open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A sweat bee

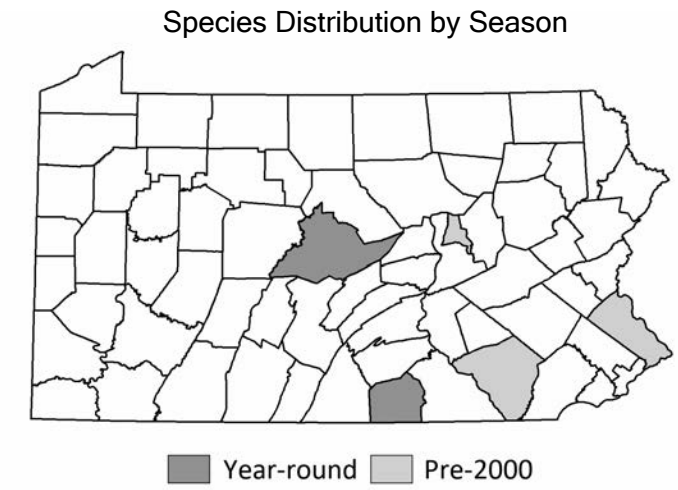
Lasioglossum pectinatum

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



N. Dorian



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on groundcherries (Physalis spp.)

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Work with legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, Private Landowners, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Atwood's Sweat Bee

Lasioglossum atwoodi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



T. Murray

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: foraging in a variety of open habitats, nesting in deciduous and coniferous forest

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Dreisbach's Sweat Bee

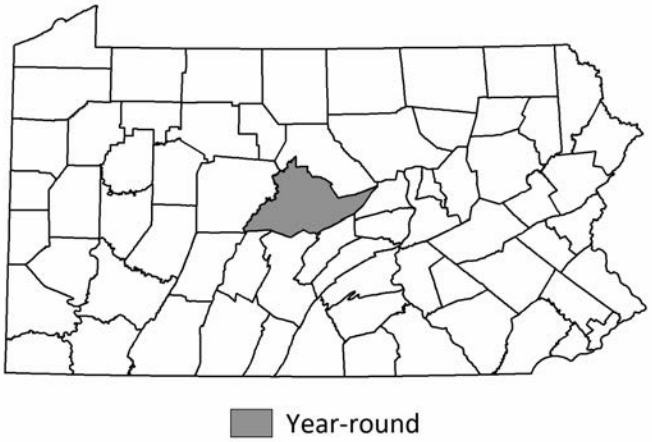
Lasioglossum dreisbachi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: a variety of open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Misbehaved Sweat Bee

Lasioglossum inconditum

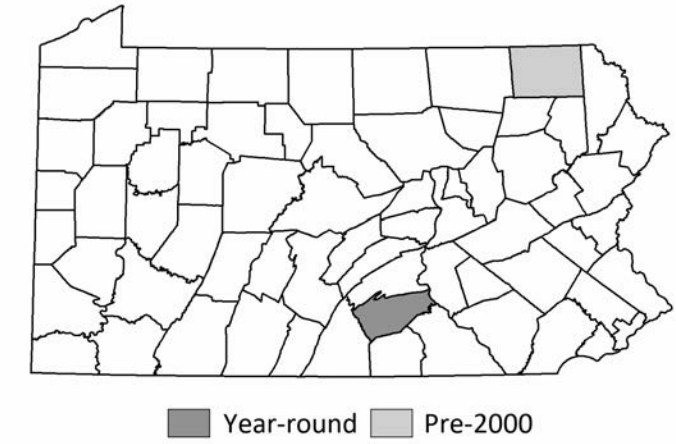
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations and improve our knowledge of the distribution of this species

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: alpine zones, northern regions, shrublands, and disturbed or suburban areas

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Awesome Sweat Bee

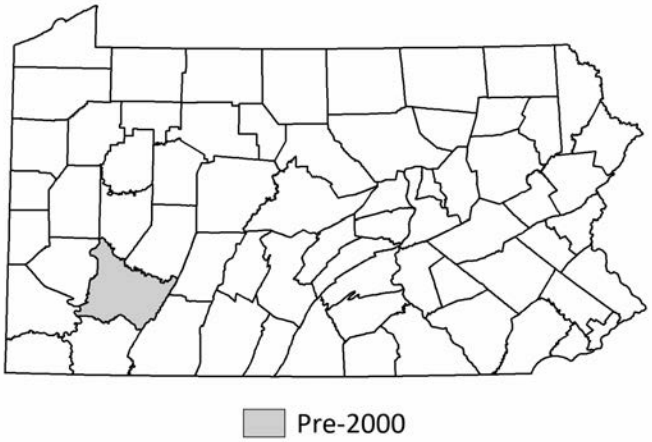
Lasioglossum izawsum

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This species is suspected to be a kleptoparasite of Lasioglossum katherinae, a species that generally uses open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Michigan Sweat Bee

Lasioglossum michiganense

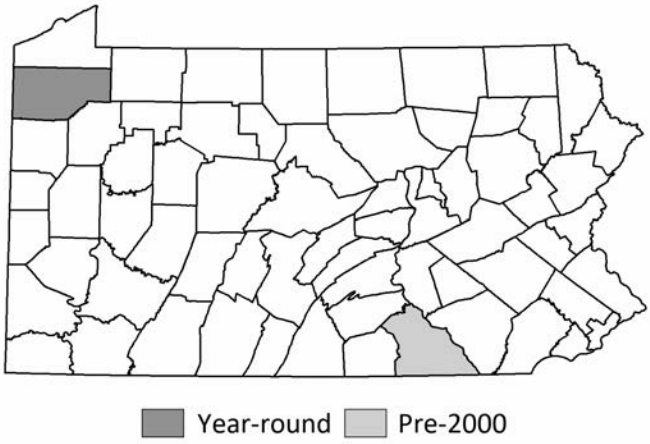
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Gibbs

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: a variety of open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Work with legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators:

Locations: Physiographic Province: Appalachian Plateaus, Piedmont

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Hoary Sweat Bee

Lasioglossum pruinosum

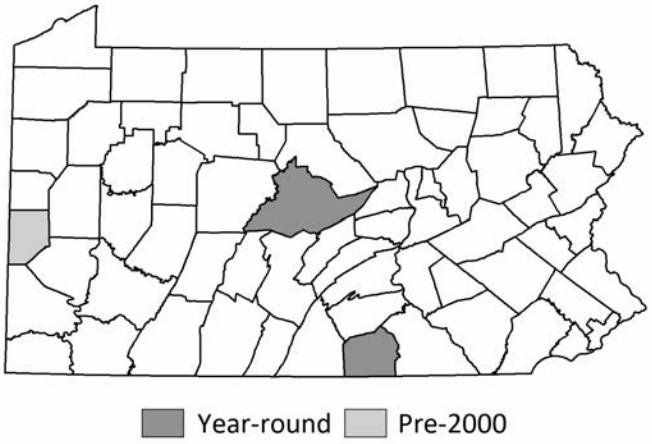
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Abel

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations and improve our knowledge of the distribution of this species

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: uses a variety of open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Work with legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Taylor's Sweat Bee

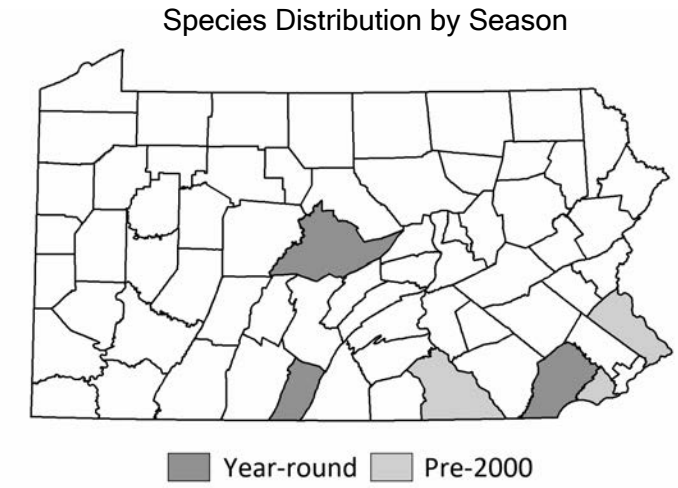
Lasioglossum taylorae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: uses a variety of open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Work with legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Timothy's Sweat Bee

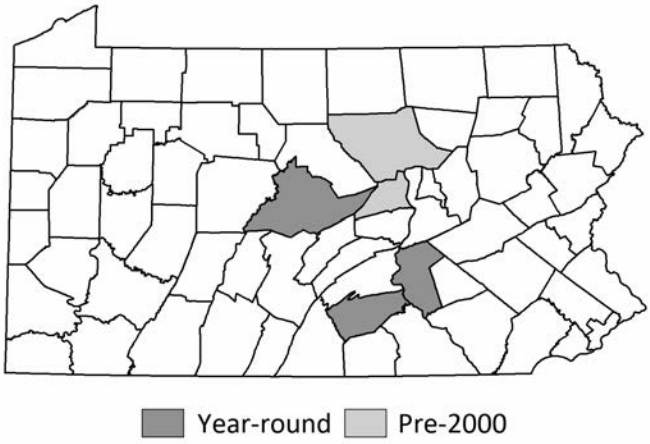
Lasioglossum timothyi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: uses a variety of open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Work with legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Petulant Leaf-cutter Bee

Megachile petulans

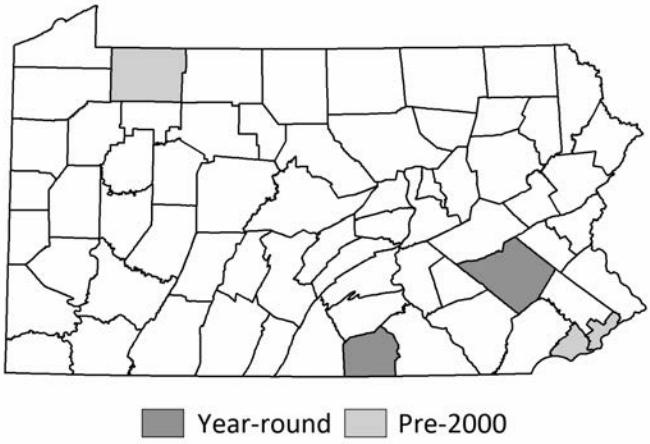
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Tyler

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our knowledge of the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: open fields, meadows with scattered trees, suburban areas, and orchards

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicontinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	General bee surveys across the state are needed to improve our understanding of the distribution and status of this rarely collected generalist bee.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Common Long-horned Bee

Melissodes communis

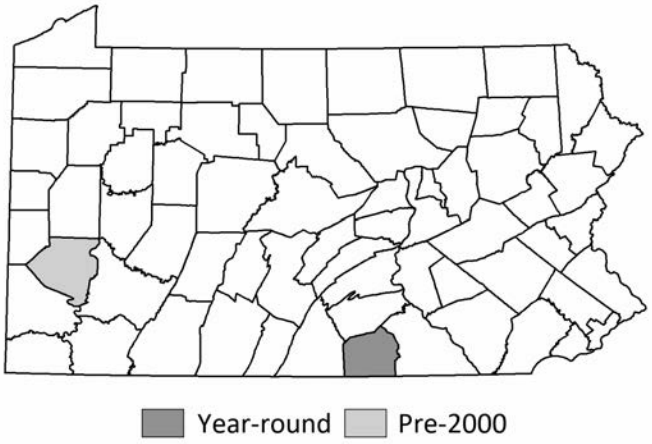
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Keim

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A callirhoe bee

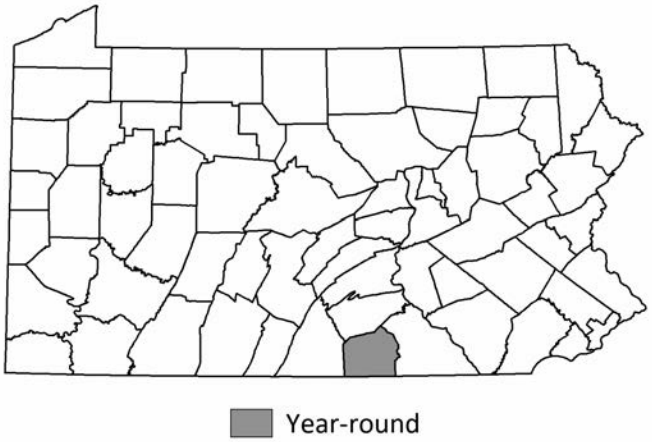
Melissodes fimbriata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: uses a variety of open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A callirhoe bee

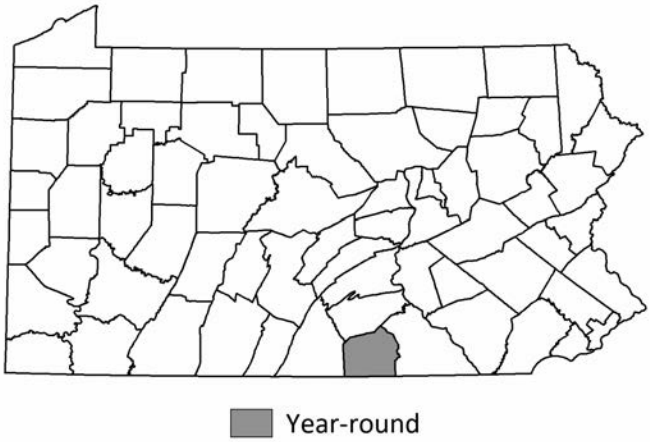
Melissodes tepaneca

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



M. Wong

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open to shrubby habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A callirhoe bee

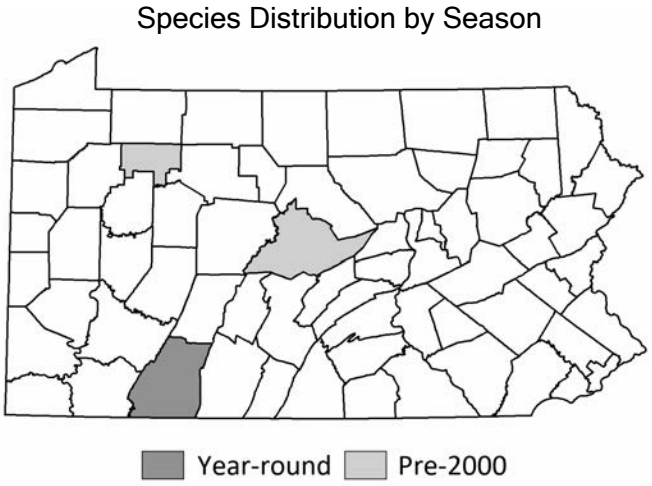
Melissodes boltoniae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Tyler



Conservation Profile

PA 10-Year Conservation Goal: Inventory bees at 200 populations of summer- and fall-flowering Asteraceae (such as asters, goldenrods, sunflowers, etc.) across Pennsylvania, to improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open habitats with aster family flowers

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A callirhoe bee

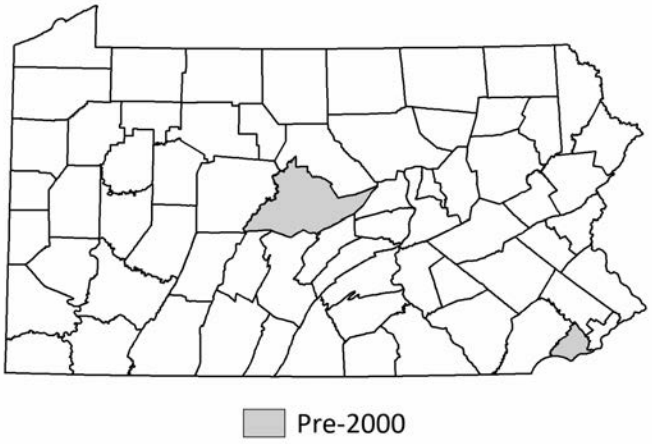
Melissodes nivea

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: This bee is a pollen specialist on the family Asteraceae, and it uses a variety of open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Physiographic Province: Ridge and Valley, Piedmont

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Summer Miner Bee

Protandrena aestivalis

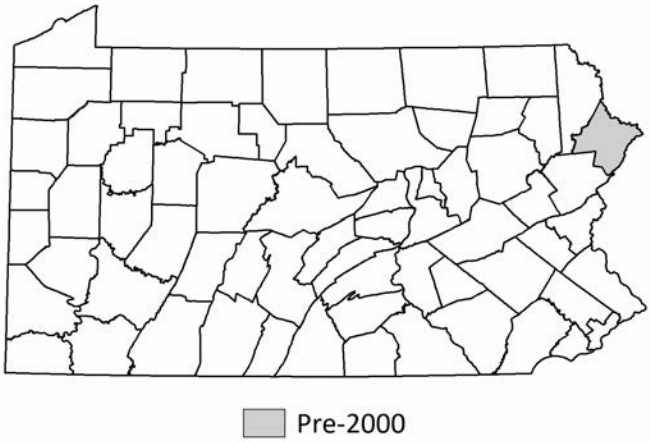
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: a variety of mostly open habitats, including forest and grassland

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	More general bee surveys across the state are needed to determine whether this bee still occurs in Pennsylvania.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Small Miner Bee

Protandrena parvus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Beunen

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Utility and Service Lines

Threat Impact: Low

Specific Threat: Planting gas and electric rights-of-way in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Work with utility companies and private landowners to plant ROWs with native, pollinator-friendly plants, and maintain these area (by mowing regime, invasive plant management, etc.) to provide habitat for pollinators.

Objective: Improve pollinator habitat at 50 ROW sites.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: number of sites, acreage of sites, and condition of habitat.

Potential Collaborators: Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Nimble Cuckoo Sweat Bee

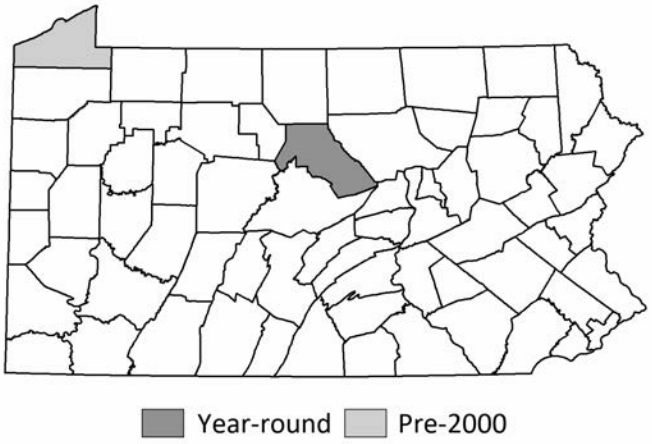
Sphecodes levis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Open and edge habitats

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Kissing Cuckoo Carder Bee

Stelis labiata

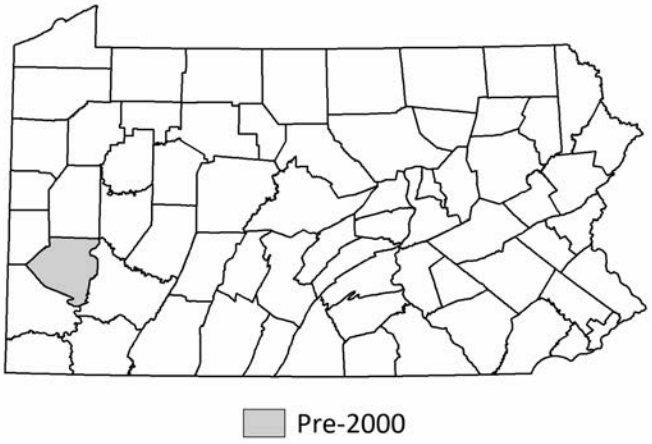
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This species is a nest parasite of Hoplitis species, which tend to use open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Oblique Long-horned Bee

Svastra obliqua

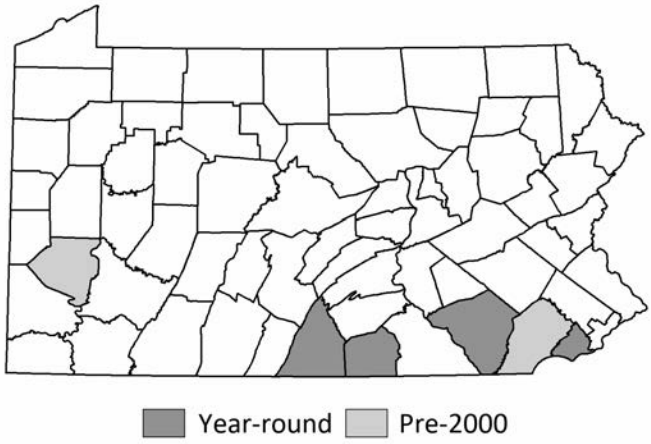
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



pcowartrickmanphoto

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: uses a variety of open and wooded habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

White-breasted Cuckoo Nomad Bee

Triepeolus pectoralis

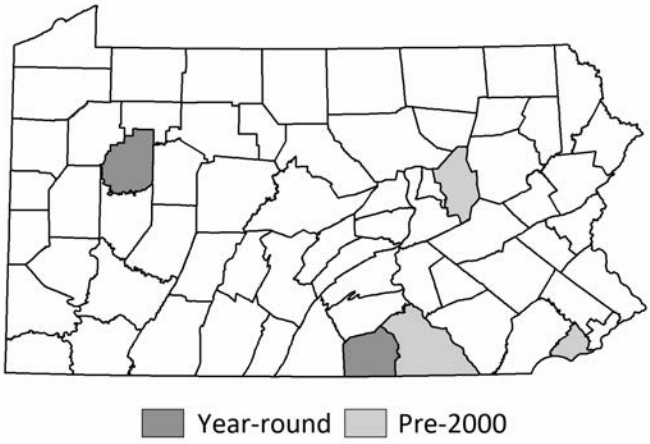
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Tingley

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open habitats with aster family flowers

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Medium - Low

Specific Threat: Conversion of natural areas to commercial/industrial development generally reduces the availability of a wide variety of pollen and nectar sources. The resulting changes in the bee community can result in the loss of kleptoparasitic bee species such as this one, although our understanding of host associations remains limited. This genus of bee in particular has been strongly negatively associated with urbanization (Quinlan et al 2023). Pesticides used in commercial landscaping can be a serious threat to native bees in these settings.

Action Category: Conserve via zoning or informal designations

Specific Action: Use zoning measures to discourage commercial development in areas designated as Natural Heritage Areas.

Objective: Implement conservation zoning in Core Habitat areas

Action Priority: **Action Urgency:** **Measure:** Number of core habitats protected by zoning

Potential Collaborators: Township Zoning Boards

Locations: Statewide

Other species likely to benefit from this action: All SGCN will benefit

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A cuckoo bee

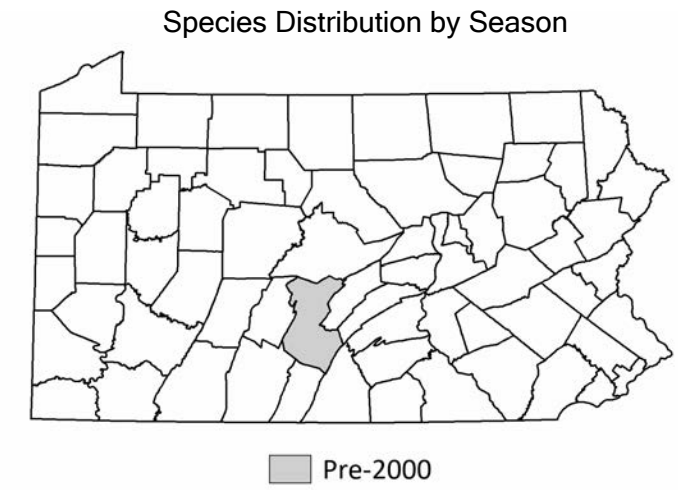
Triepeolus quadrifasciatus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Fraser



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: open habitats and edges

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Provide technical expertise to help legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A cuckoo bee

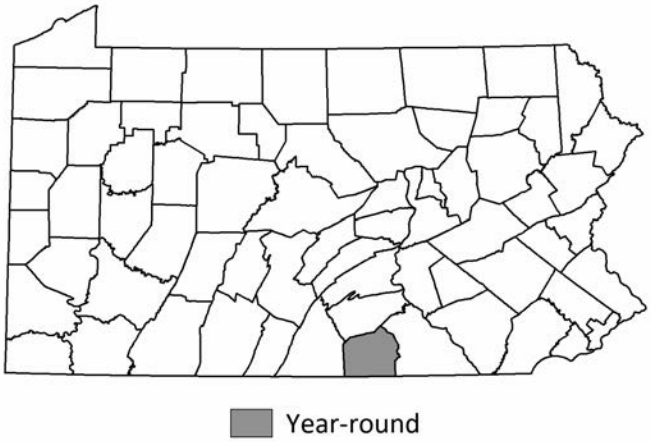
Triepeolus nevadensis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Improve our knowledge of the distribution of this species, by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Medium - Low

Specific Threat: Conversion of natural areas to commercial/industrial development generally reduces the availability of a wide variety of pollen and nectar sources. The resulting changes in the bee community can result in the loss of kleptoparasitic bee species such as this one, although our understanding of host associations remains limited. This genus of bee in particular has been strongly negatively associated with urbanization (Quinlan et al 2023). Pesticides used in commercial landscaping can be a serious threat to native bees in these settings.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should give jurisdictional authority for terrestrial invertebrates to a state agency

Objective: Pass a state law specifying which state agency should have jurisdictional authority to protect terrestrial invertebrates.

Action Priority: **Action Urgency:** Initiate within 5 years **Measure:** passage of the law

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: Over 10,000 invertebrate species, including the majority of the SGCN invertebrates, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

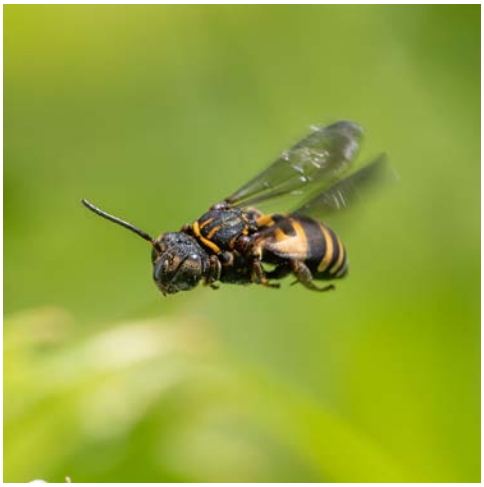
PENNSYLVANIA WILDLIFE ACTION PLAN

A cuckoo bee

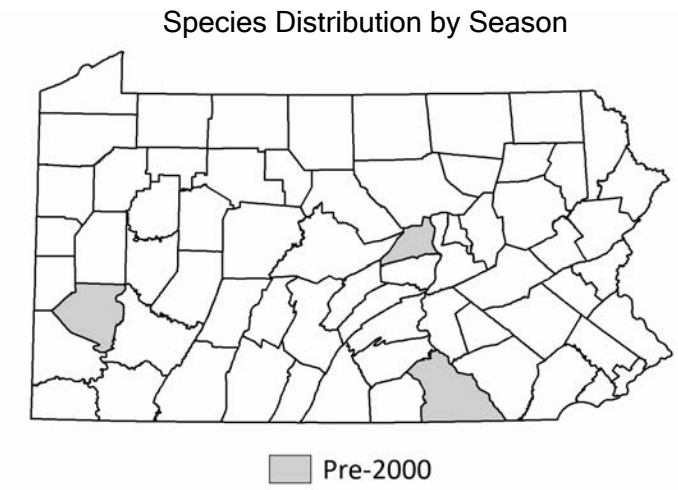
Triepeolus simplex

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Chen



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: open habitats and edges

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Provide technical expertise to help legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Red-lipped Cuckoo Nomad Bee

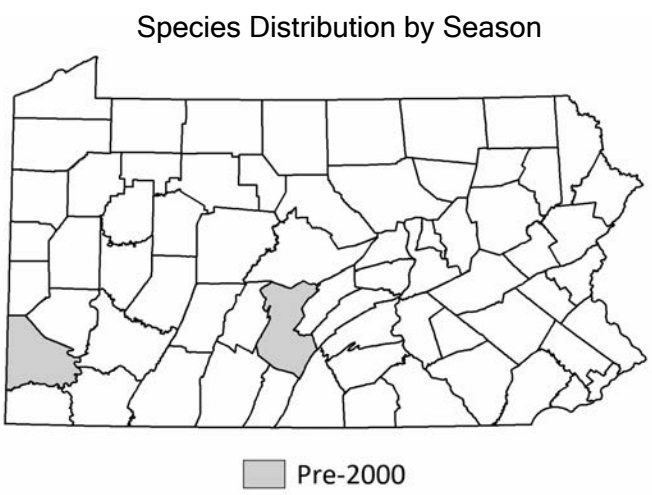
Triepeolus rhododontus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: often nests in hard-packed ground in stands of blueberry; also in orchards.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Provide technical expertise to help legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Bear-like Digger Bee

Anthophora ursina

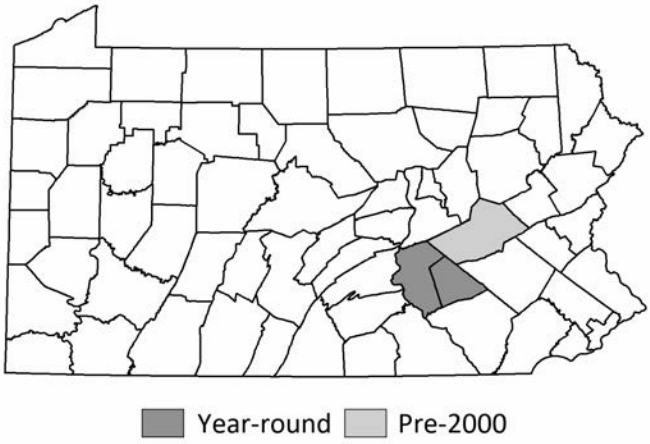
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



pippin7512

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: A pollen generalist, nesting in exposed banks, eroded cliffs, and bare slopes.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A metallic sweat bee

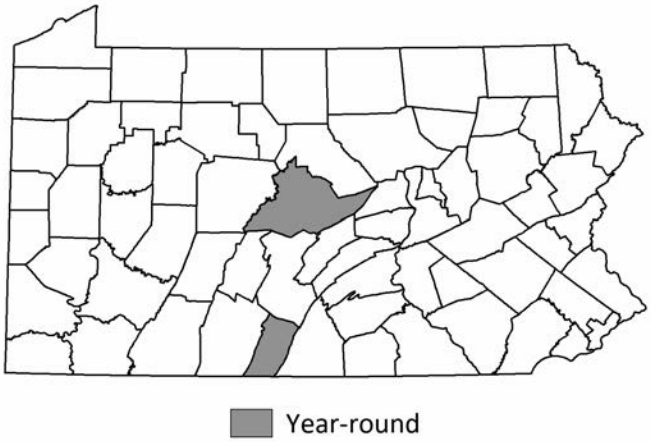
Lasioglossum wheeleri

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: shale and scrub oak barrens, and possibly other habitats as well.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Work with legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Drury's Long-horned Bee

Melissodes druriella

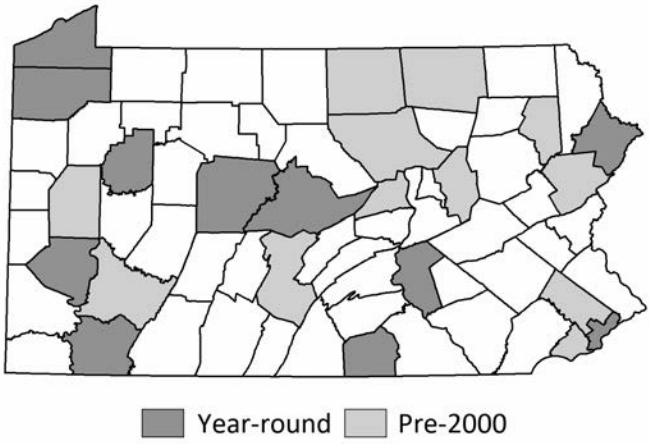
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



H. Holm

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: uses a variety of open habitats; a pollen specialist on Asteraceae.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Valiant Long-horned Bee

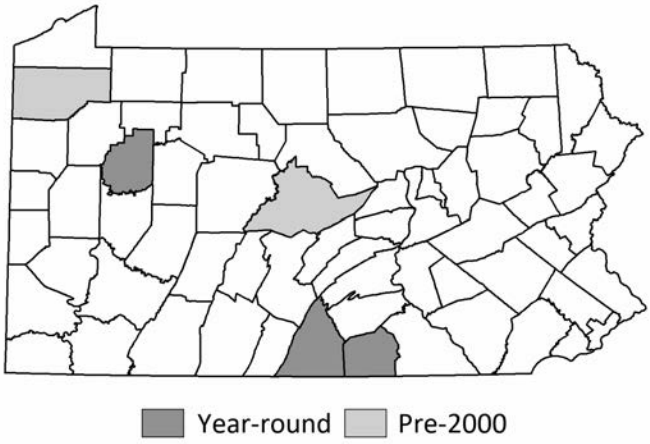
Melissodes illata

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



B. Noble

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations and improve our understanding of the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: This bee is a pollen specialist on Asteraceae, and uses a variety of open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Physiographic Province: Piedmont, Ridge and Valley, Appalachian Plateaus

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Vigorous Long-horned Bee

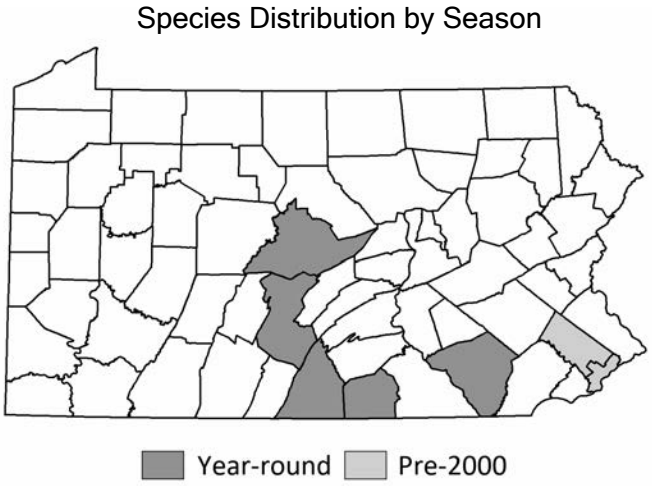
Melissodes subillata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: This bee is a pollen specialist within the family Asteraceae, and it uses a variety of open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Medium - Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Physiographic Province: Ridge and Valley, Piedmont

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

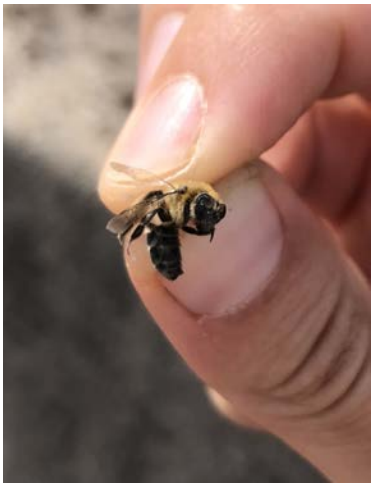
PENNSYLVANIA WILDLIFE ACTION PLAN

An andrenid bee

Andrena asteroides

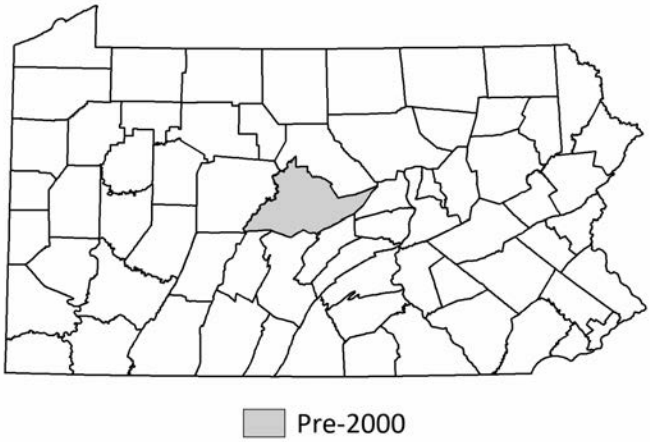
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



lrussoutk

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on asters (Symphyotrichum spp.)

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadside habitats in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Comments: Andrena asteroides is a pollen specialist on asters (Symphyotrichum spp.), and can be detected by focusing surveys on this plant.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An andrenid bee

Andrena banksi

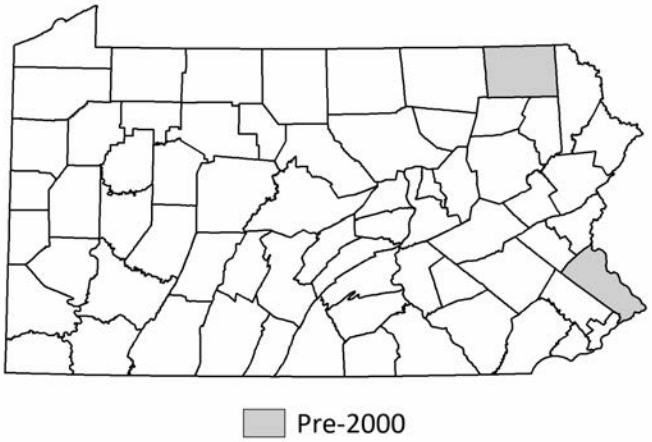
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Harris

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: hardwood forests, mixed woodlands, suburban orchards, and urban areas

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM). The choice of whether to use neonicotinoid-treated seed should be guided by IPM principles.

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following see SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	General bee surveys across the state are needed to improve our knowledge of the distribution and status of this rarely collected bee. Surveys should be coordinated with the Pennsylvania Bee Monitoring Program.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An andrenid bee

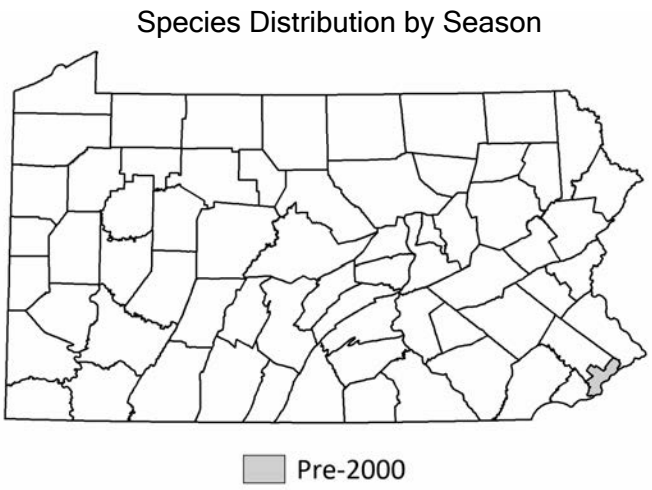
Andrena dimorpha

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



zm77



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing bee inventory efforts.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: near agricultural fields, orchards, and open woodlands

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Physiographic Province: Piedmont

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An andrenid bee

Andrena fenningeri

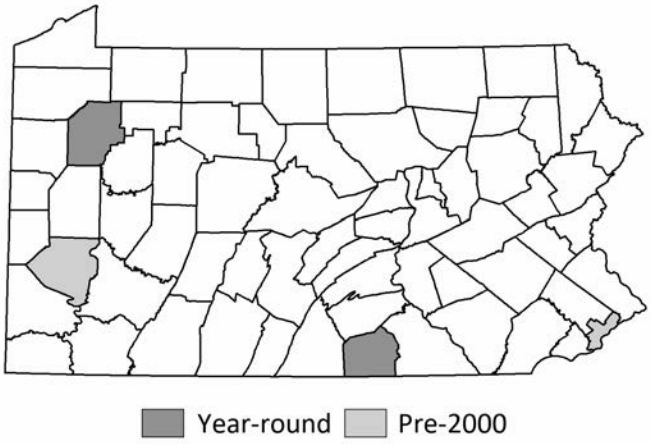
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: hardwood forests, suburban areas, orchards

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

An andrenid bee

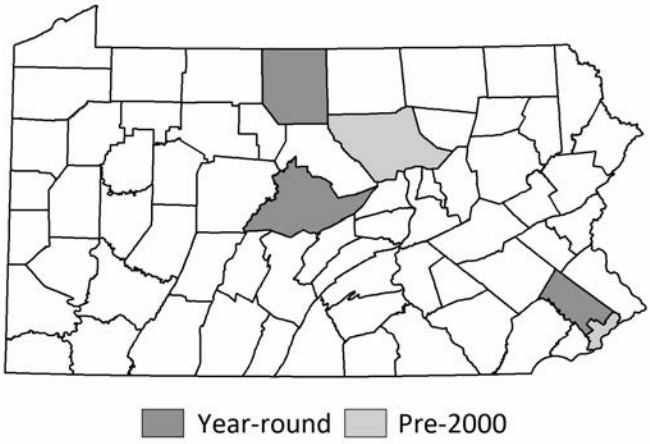
Andrena sayi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our knowledge of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: forests, forest edges, suburban areas, and orchards

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: U.S. Department of Agriculture-Natural Resources Conservation Service, Other state agency, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus, Ridge and Valley, Atlantic Coastal Plain, Piedmont. Physiographic Section: Deep Valleys, Appalachian Mountain, Lowland and Intermediate Upland, Gettysburg-Newark Lowland

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	More general bee surveys across the state are needed to understand the status of this uncommonly collected generalist bee.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An andrenid bee

Andrena wilmattae

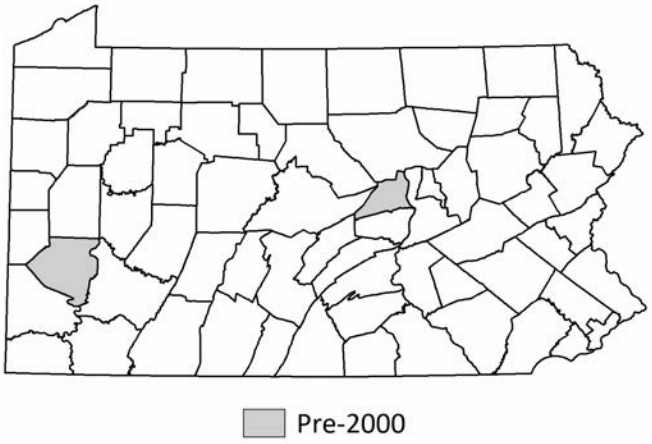
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



T. Wood

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether or not this bee is still present in Pennsylvania

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: grasslands, open herbaceous areas.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicontinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulens.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	More general bee surveys across the state are needed to determine if this bee is still present in Pennsylvania.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

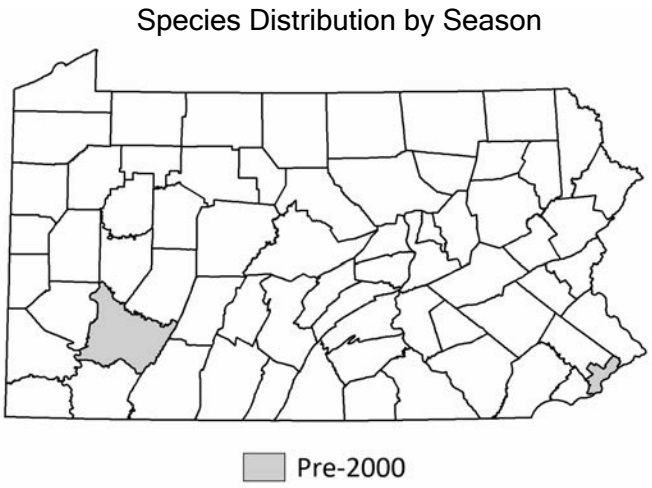
An andrenid bee

Andrena ilicis

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



USGS Bee Inventory and Monitoring Lab



Conservation Profile

PA 10-Year Conservation Goal: Improve our knowledge of the distribution of this species, by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forest, woodland, and orchard

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	General bee surveys across the state are needed to determine whether this generalist bee still occurs in Pennsylvania. Surveys should be coordinated with the Pennsylvania Bee Monitoring Program.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An andrenid bee

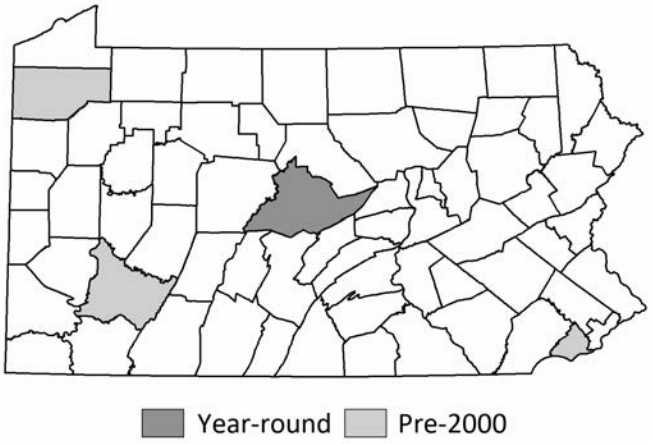
Andrena illini

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



Celeste

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and continue toImprove our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open to forested habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An andrenid bee

Andrena gardineri

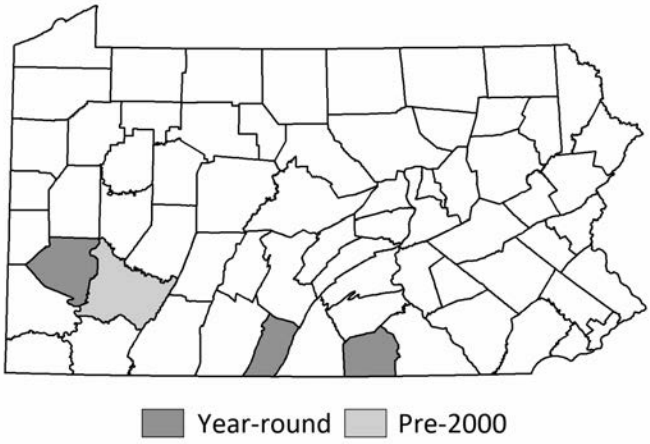
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



jgibbs

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and continue to improve our knowledge of the species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on ragworts (Packera spp.). May be restricted to Small's ragwort (P. anonyma) and round-leaved ragwort (P. obovata), in which case it would be mostly limited to at least moderately calcareous soils.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: The dry, open, calcareous habitats used by round-leaved ragwort (Packera obovata), the bee's probable main host, are prone to invasion by invasive plants such as knapweed (Centaurea spp.) and sterile brome (Bromus sterilis), which displace the host plants.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: At sites where the bee occurs, evaluate populations of round-leaved ragwort or Small's ragwort or golden ragwort, and control any invasive plants that are threatening the host plants.

Objective: Conduct surveys for this bee at at least 50 sites with golden ragwort or round-leaved ragwort, distributed across the state, evaluating invasive plants and other threats wherever the bee is found. Identify up to ten priority sites for invasive plant control. Write management plans for invasive plant control, and carry out plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of surveys performed; number of populations evaluated; number of weed management plans carried out.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau, Allegheny Mountain, Allegheny Front, Appalachian Mountain, Great Valley, South Mountain, Gettysburg-Newark Lowland, Piedmont Lowland, Gettysburg-Newark Lowland, Piedmont Upland, Piedmont Upland, Piedmont Lowland, Piedmont Lowland, Piedmont Upland, Piedmont Lowland

Other species likely to benefit from this action: Nomada seneciophila (presence not yet proven in PA but possible), Packera spp.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An andrenid bee

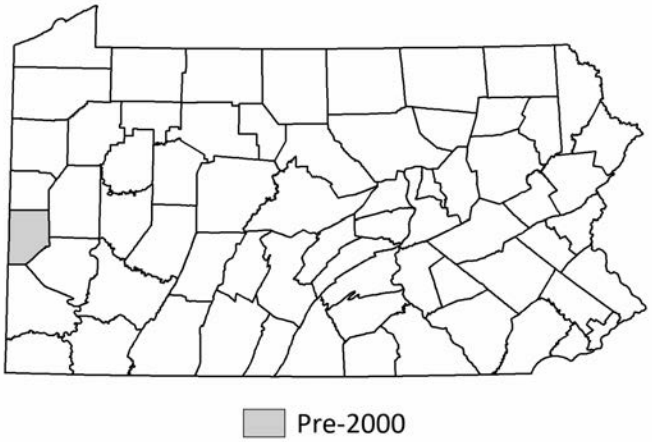
Andrena lamelliterga

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



S. Willhelm

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this bee is still present in Pennsylvania, but surveying bees at populations of Miami mist (Phacelia purshii) and Appalachian phacelia (Phacelia dubia).

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on Phacelia spp. In Pennsylvania it would be limited to Miami Mist (Phacelia purshii), which grows in rich mesic soils in southwest PA, and Appalachian Phacelia (P. dubia), which grows on Shale barrens and outcrops along the lower Susquehanna River.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: South-Central Interior Mesophytic Forest

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plants of this specialist moth are particularly susceptible to invasive plants, which crowd the host plant out of its habitat. While the host plants may not be catastrophically impacted in the next ten years, but a slow and steady decline of host plants is expected in the absence of action.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Identify sites where Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) occur on state lands. Evaluate those sites for invasive plants, and use herbicide to control the plants in cases where they threaten the Phacelia species.

Objective: Evaluate 9 populations of Phacelia spp. on state lands, and actively manage all that are threatened by invasive plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Number of sites evaluated. Percent control of invasive species achieved at each managed site.

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau, Allegheny Mountain, Allegheny Front, Appalachian Mountain, Great Valley, South Mountain, Gettysburg-Newark Lowland, Piedmont Upland, Piedmont Lowland

Other species likely to benefit from this action: The six SGCN that use Phacelia spp. would benefit; this includes 3 bees: Andrena phaceliae, Andrena lamelliterga, and Hoplitis simplex; and 3 moths: Tinagma gaedikei, Ethmia zelleriella, and Ethmia macelhosiella. Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) would also benefit.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Determine which populations of Phacelia spp. support which of the 6 specialist insects. Most of those insects can be surveyed while the host plants are in bloom (mid- to late May). The moth Ethmia macelhosiella may require a black light survey in October/November. Surveys could be performed by the PA Bee Monitoring Project, WPC, or other qualified individuals.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An andrenid bee

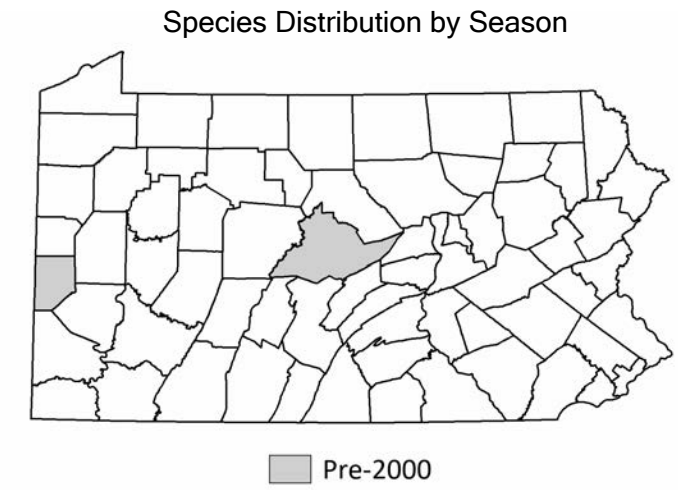
Andrena phaceliae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal: Maintain the known populations of this bee through 2035, and continue to inventory bees on of Miami mist (Phacelia purshii) and Appalachian phacelia (Phacelia dubia).

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on Phacelia spp. In Pennsylvania it would be limited to Miami Mist (Phacelia purshii), which grows in rich mesic soils in southwest PA, and Appalachian Phacelia (P. dubia), which grows on Shale barrens and outcrops along the lower Susquehanna River.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: South-Central Interior Mesophytic Forest

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plants of this specialist moth are particularly susceptible to invasive plants, which crowd the host plant out of its habitat. While the host plants may not be catastrophically impacted in the next ten years, but a slow and steady decline of host plants is expected in the absence of action.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Identify sites where Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) occur on state lands. Evaluate those sites for invasive plants, and use herbicide to control the plants in cases where they threaten the Phacelia species.

Objective: Evaluate 9 populations of Phacelia spp. on state lands, and actively manage all that are threatened by invasive plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Percent control of invasive species achieved at each site

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Ridge and Valley, Ridge and Valley, Piedmont, Piedmont, Piedmont. Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau, Allegheny Mountain, Allegheny Front, Appalachian Mountain, Great Valley, South Mountain, Gettysburg-Newark Lowland, Piedmont Lowland, Piedmont Upland

Other species likely to benefit from this action: The six SGCN that use Phacelia spp. would benefit; this includes 3 bees: Andrena phaceliae, Andrena lamelliterga, and Hoplitis simplex; and 3 moths: Tinagma gaedikei, Ethmia zelleriella, and Ethmia macelhosiella. Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) would also benefit.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Determine which populations of Phacelia spp. support which of the 6 specialist insects. Most of those insects can be surveyed while the host plants are in bloom (mid- to late May). The moth Ethmia macelhosiella may require a black light survey in October/November. Surveys could be performed by the PA Bee Monitoring Project, WPC, or other qualified individuals.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

An andrenid bee

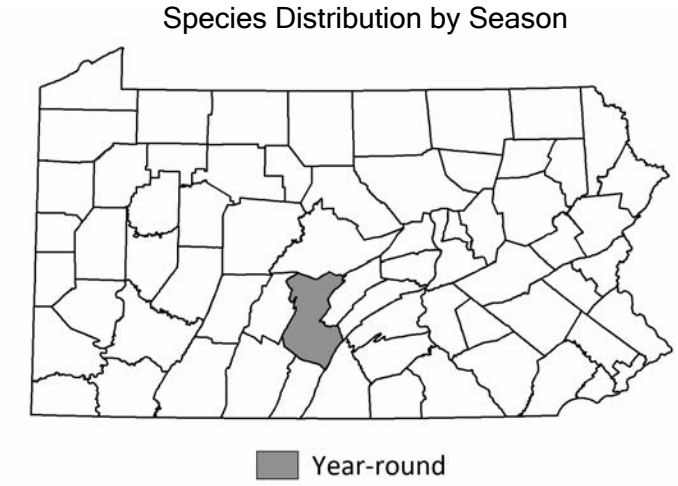
Andrena rudbeckiae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



H. Holm



Conservation Profile

PA 10-Year Conservation Goal: Determine whether the species is still present within the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on coneflowers (Ratibida spp. and Rudbeckia spp.)

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, is vulnerable to neonicotinoid exposure.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicontinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Bee surveys on flowers in the genera Rudbeckia and Ratibida should be conducted across the state to improve our knowledge of the distribution and status of this pollen specialist bee. Surveys should be coordinated with the Pennsylvania Bee Monitoring Project	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pigmented Miner Bee

Andrena chromotricha

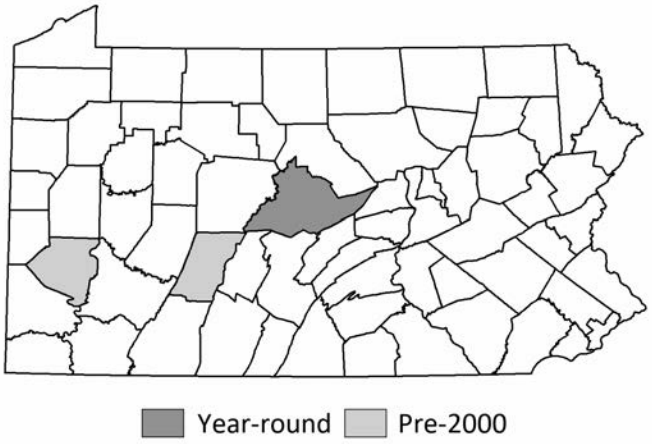
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Hardy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on Asteraceae.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Eight-spotted Miner Bee

Perdita octomaculata

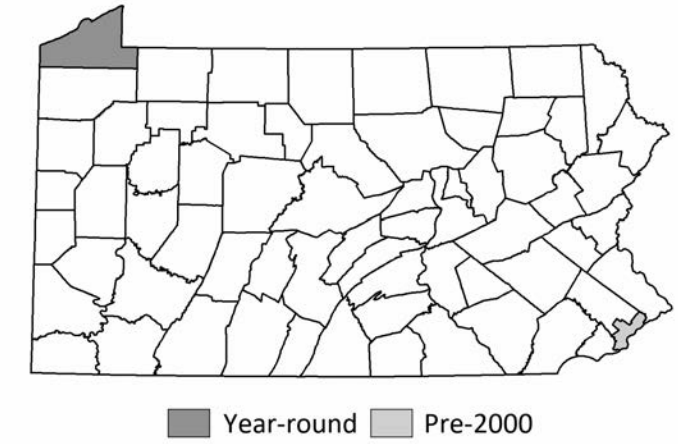
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



L. Burns

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known population, and improve our knowledge of the bee's distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: sandy open habitat with plants in the aster family.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Succession of open sand barrens to forest would exclude the species.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Hectares opened

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Bellwort Miner Bee

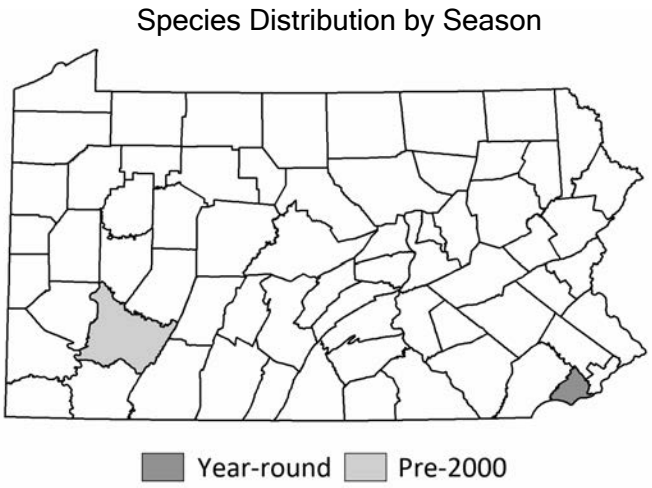
Andrena uvulariae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and improve our knowledge of the bee's distribution in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on bellworts (Uvularia spp.)

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Many invasive plants can easily colonize the rich mesic habitats favored by bellworts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Monitor and control invasive plants in and around the populations of bellworts (Uvularia spp.) that support the bee.

Objective: Conduct surveys for this bee at at least 50 sites with bellworts (Uvularia spp.), distributed across the state, evaluating invasive plants and other threats wherever the bee is found. Identify ten priority sites for invasive plant control. Write management plans for invasive plant control, and carry out plans.

Action Priority: 4-Low **Action Urgency:** Can wait 10 years to initiate **Measure:** reduction in invasive plant populations

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: a wide variety of native herbaceous plants will benefit from removal of invasive plants.

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: This bee depends exclusively on bellworts (Uvularia spp.) as a pollen source, but this plant is a preferred food of deer. "Deer can devastate bellwort populations" (Morton Arboretum at https://mortonarb.org/).

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Install deer fencing around those populations of bellworts (Uvularia spp.) that are known to support the bee.

Objective: Conduct surveys for this bee at at least 50 sites with bellworts (Uvularia spp.), distributed across the state, evaluating deer browse and other threats wherever the bee is found. Identify up to ten priority sites that would benefit from deer exclosures, and install deer exclosures at those sites.

Action Priority: 4-Low **Action Urgency:** Can wait 10 years to initiate **Measure:** number and area of deer exclosures

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus, Ridge and Valley, Piedmont

Other species likely to benefit from this action: A wide variety of herbaceous and woody plants would benefit from reduced deer pressure.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Sunflower Sweat Bee

Dieunomia heteropoda

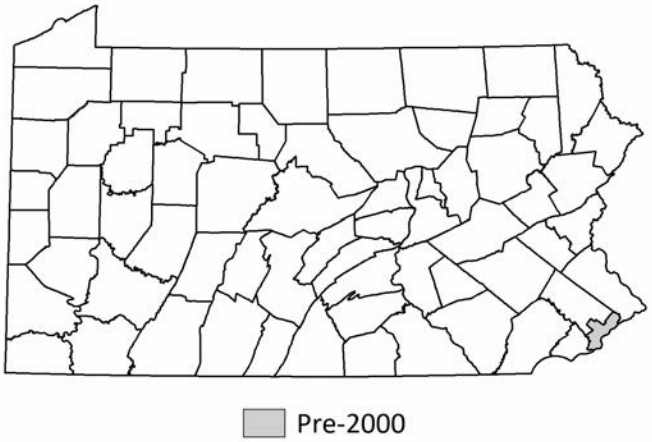
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



etheostomaexile

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this bee is still present in Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on beggars' ticks (Bidens spp.), which grows in open wetland and upland habitats.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Freshwater Marsh

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, is vulnerable to neonicotinoid exposure.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicontinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Most pollinator species will benefit from having less exposure to neonicotinoids.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Bee surveys focused on beggars' ticks (Bidens spp.) and sunflowers (Helianthus spp.) are needed to determine whether this pollen specialist bee is still present in Pennsylvania. Surveys should be coordinated with the Pennsylvania Bee Monitoring Program.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Mallow Bee

Melitoma taurea

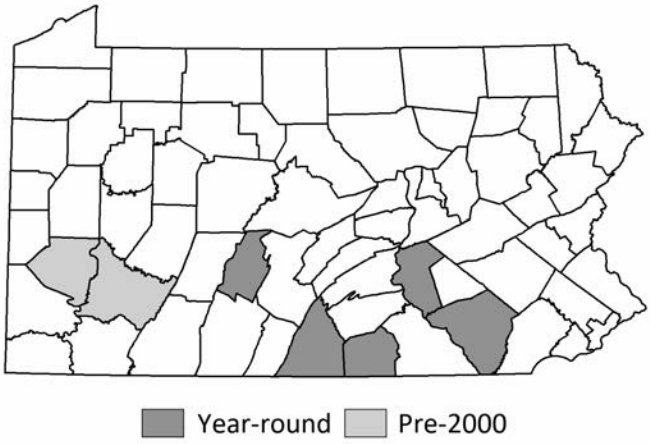
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



L. Hughes

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Improve our knowledge of the distribution of this species by inventorying bees on patches of big morning glory (Ipomoea pandurata).

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: This bee is a specialist on Calystegia spp. and Ipomoea spp., which usually occur along edges and in open areas.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, is vulnerable to neonicotinoid exposure.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicontinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rehn's Miner Bee

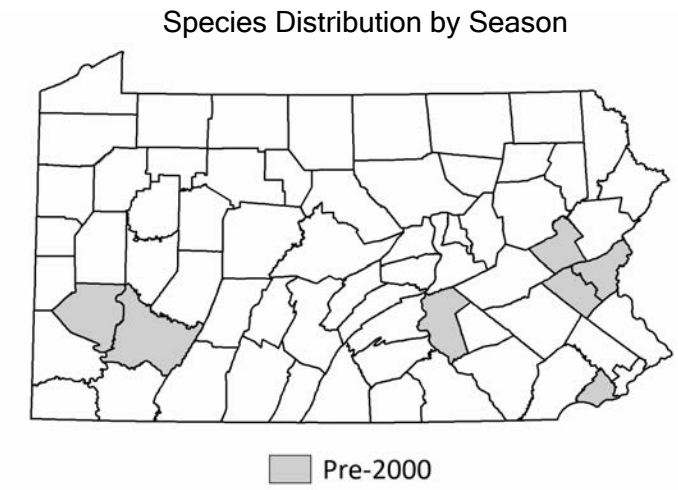
Andrena rehni

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab



Conservation Profile

PA 10-Year Conservation Goal: Find out whether this bee still occurs in Pennsylvania, by inventorying bees on Allegheny chinquapin (Castanea pumila) and other Castanea spp.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: A pollen specialist on chestnusts (Castanea spp.), including American chestnut (C. dentata), Allegheny chinquapin (Castanea pumila), and Chinese chestnut (C. mollissima).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Loss of American chestnut trees (Castanea dentata) due to chestnut blight (Cryphonectria parasitica).

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant blight-resistant American chestnuts when they are available.

Objective: Depends on availability of blight-resistant trees.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Number of trees planted; number of sites with trees.

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: Lesser Chestnut Weevil (Curculio sayi) Allegheny Woodrat (Neotoma magister)

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys for Rehn's Miner Bee are needed to determine whether this bee is still present in Pennsylvania. Stands of chinquapin (Castanea pumila) and Chinese chestnut (Castanea mollissima) should be surveyed. The Pennsylvania Bee Monitoring Program may be able to assist with surveys.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Poor Miner Bee

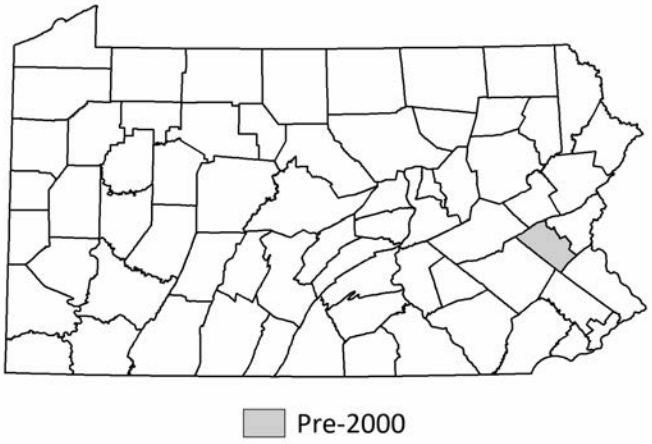
Protandrena pauper

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by inventorying bees at populations of New Jersey Tea (Ceanothus americanus).

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: This bee is a pollen specialist on New Jersey Tea (Ceanothus americanus). Open xeric conditions; poor soils.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Problematic Native Species/Diseases

Threat Impact: Very High - High

Specific Threat: This bee depends exclusively on New Jersey Tea (Ceanothus americana) as a pollen source, but this plant is a favorite food of deer. While this formerly abundant plant is not yet categorized as rare in PA, populations are usually very small, and there are very few populations large enough to sustain a population of this monolectic bee.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Install deer fencing around those populations of New Jersey Tea that are known to support specialist herbivores. If data is lacking, assume that larger populations harbor at least one of the SGCN specialists.

Objective: Protect 10 populations of New Jersey Tea with deer exclosures

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Number and area of exclosures built; change in area of New Jersey Tea colony

Potential Collaborators: Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulate) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** High

Specific Threat: Many of the remaining populations of New Jersey Tea are on electric rights-of-way. Although this shrub never grows high enough to be a problem for electric wires, it is often sprayed with herbicides by applicators who do not distinguish one woody plant from another, and whole populations can be needlessly destroyed this way.

Action Category: Outreach, communication and distribution

Specific Action: Work with electric and gas ROW managers, and with landowners, to protect populations of New Jersey Tea (Ceanothus americanus), Wild Indigo (Baptisia tinctoria), and Sundial Lupine (Lupinus perennis) that are vulnerable to ROW management practices.

Objective: Identify populations of these plants on ROWs, and prioritize populations of each species by population size/area and by known presence of target invertebrate specialist species. Get landowners and managers to agree on management plans for each site.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of plans written.

Potential Collaborators: Businesses, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulata) New Jersey Tea Leafroller Moth (Filatima n. sp.)

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys for the six New Jersey Tea specialist SGCN should be conducted where medium to large patches of New Jersey Tea are found. Presence of one of these species is evidence that the patch may be large and stable enough to support some of the other species. Surveys could be conducted by the PA Bee Monitoring Program, the Western PA Conservancy, or other qualified individuals.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Long-faced Plasterer Bee

Colletes validus

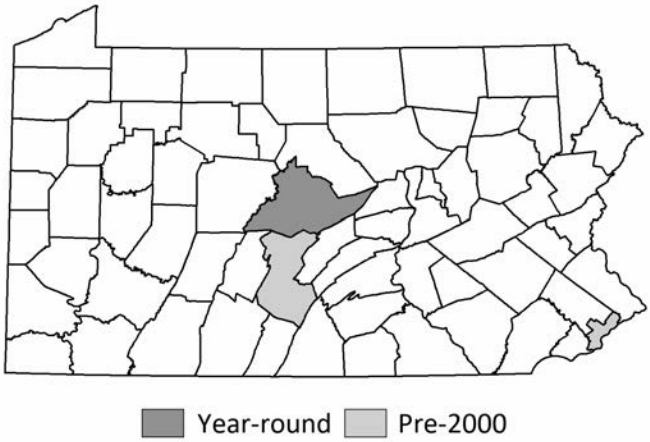
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: This bee is a pollen specialist on heaths, and it requires sandy habitats for nesting.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Fire suppression resulting in canopy closure and reduction in heaths.

Action Category: Manage non-living habitat components

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality and allow recolonization of sensitive species.

Objective: Many insects use early successional habitats like meadows, grasslands, and barrens that require periodic disturbance to keep them open. Some of these species have eggs, larva, and pupae that are especially vulnerable to fire. Conduct baseline inventories to determine where these species occur. Develop and update management plans to include best practices that reduce negative impacts to fire sensitive species. Use prescribed fire and/or mowing to maintain a mosaic of vegetation structure that includes woodlands, shrublands, and low grassy/forb openings. Define the core habitat for each species of concern based on the habitat subtypes and host plants they utilize. Burn or mow no more than a quarter of their core habitats in a year. Delineate and protect sections of core habitat as refugia during management. Make some management units permanent fire refugia, where fire is never deliberately applied. Expand the core habitat by restoring adjacent areas that have succeeded into forest.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of prescribed burn plans written, which specifically incorporated the needs of invertebrate SGCN.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Macropis Cuckoo Bee

Epeoloides pilosula

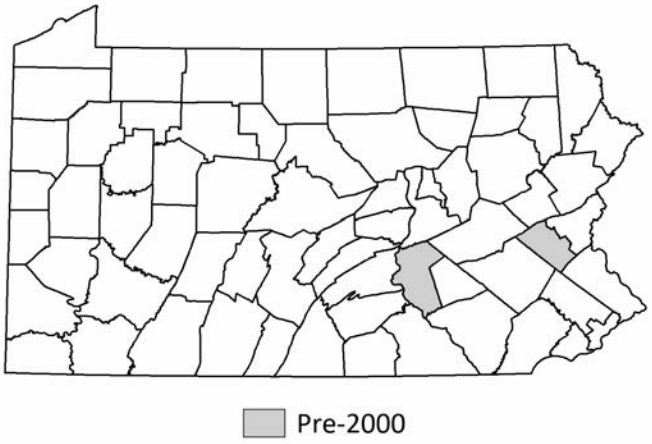
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Mirick

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain the one known population, and seek more populations by inventorying bees at populations of fringed loosestrife (Lysimachia ciliata), whorled loosestrife (L. quadrifolia), and swamp candles (L. terrestris) across Pennsylvania, especially any that are known to support any species of loosestrife oil bee (Macropis spp.).

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: a specialized kleptoparasite on our 3 species of Macropis bee, which are dependent on several of our native loosestrifes, mainly swamp candles (Lysimachia terrestris), whorled loosestrife (L. quadrifolia), and fringed loosestrife (L. ciliata). L. quadrifolia is found in open xeric habitats, L. terrestris is found in marshes, and L. ciliata is found in mesic riparian areas, wet meadows, and wetland edges.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants are a significant threat to the host plants Lysimachia terrestris and L. ciliata.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive plants at sites where any Macropis species, or Epeoloides pilosula, is found.

Objective: At each site, work with land owners/managers to survey invasive plants, create a management plan, and carry out the plan.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of landowners engaged, number of plans written, and number of plans executed.

Potential Collaborators: Businesses, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Macropis ciliata, M. nuda, M. patellata, Epeoloides pilosula, Lysimachia quadrifolia, L. terrestris, L. ciliata.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Fringed Loosestrife Oil-collecting Bee

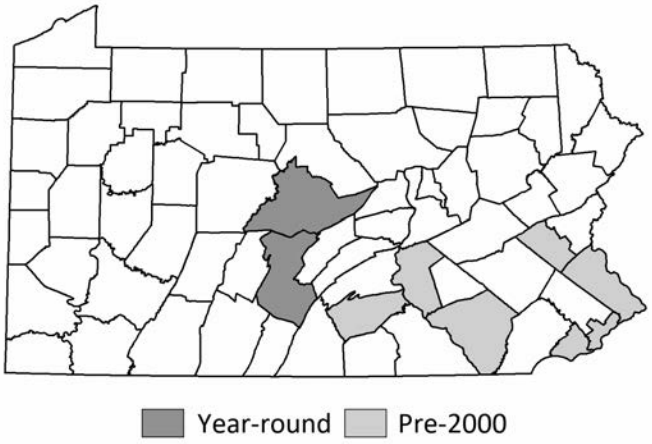
Macropis ciliata

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



M. Jacobson

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and continue surveys at populations of fringed loosestrife (Lysimachia ciliata), whorled loosestrife (L. quadrifolia), and swamp candles (L. terrestris) across Pennsylvania, to improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on several of our native loosestrifes, mainly swamp candles (Lysimachia terrestris), whorled loosestrife (L. quadrifolia), and fringed loosestrife (L. ciliata). L. quadrifolia is found in open xeric habitats, L. terrestris is found in marshes, and L. ciliata is found in mesic riparian areas, wet meadows, and wetland edges.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: North-Central Appalachian Large River Floodplain

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants are a significant threat to the host plants Lysimachia terrestris and L. ciliata.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive plants at sites where any Macropis species, or Epeoloides pilosula, is found.

Objective: At each site, work with land owners/managers to survey invasive plants, create a management plan, and carry out the plan.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of landowners engaged, number of plans written, and number of plans executed.

Potential Collaborators: Businesses, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Macropis ciliata, M. nuda, M. patellata, Epeoloides pilosula, Lysimachia quadrifolia, L. terrestris, L. ciliata.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Common Loosestrife Oil Bee

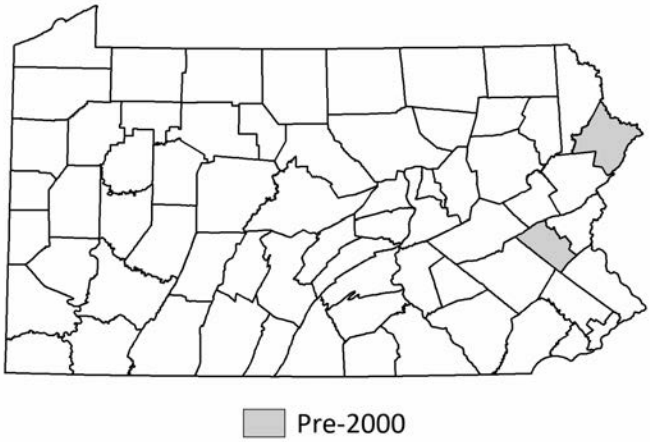
Macropis nuda

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



J. Klymo

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this bee still occurs in Pennsylvania, by inventorying bees at populations of fringed loosestrife (Lysimachia ciliata), whorled loosestrife (L. quadrifolia), and swamp candles (L. terrestris) across Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on several of our native loosestrifes, mainly swamp candles (Lysimachia terrestris), whorled loosestrife (L. quadrifolia), and fringed loosestrife (L. ciliata). L. quadrifolia is found in open xeric habitats, L. terrestris is found in marshes, and L. ciliata is found in mesic riparian areas, wet meadows, and wetland edges.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: North-Central Appalachian Large River Floodplain

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants are a significant threat to the host plants Lysimachia terrestris and L. ciliata.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive plants at sites where any Macropis species, or Epeoloides pilosula, is found.

Objective: At each site, work with land owners/managers to survey invasive plants, create a management plan, and carry out the plan.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of landowners engaged, number of plans written, and number of plans executed.

Potential Collaborators: Businesses, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Macropis ciliata, M. nuda, M. patellata, Epeoloides pilosula, Lysimachia quadrifolia, L. terrestris, L. ciliata.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Bee's Knees Oil Bee

Macropis patellata

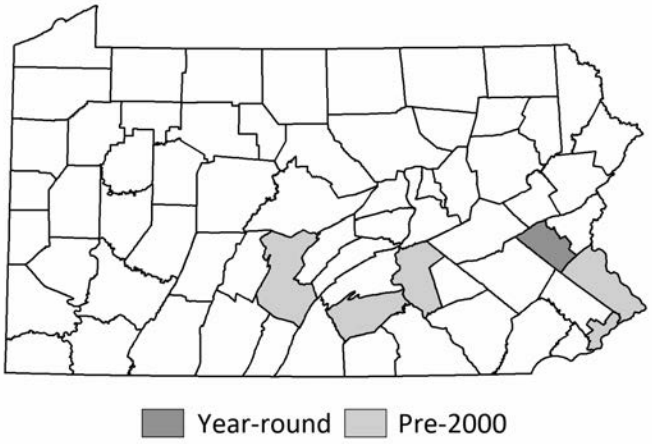
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species still occurs in the state, by inventorying bees at populations of fringed loosestrife (Lysimachia ciliata), whorled loosestrife (L. quadrifolia), and swamp candles (L. terrestris) across Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on several of our native loosestrifes, mainly swamp candles (Lysimachia terrestris), whorled loosestrife (L. quadrifolia), and fringed loosestrife (L. ciliata). L. quadrifolia is found in open xeric habitats, L. terrestris is found in marshes, and L. ciliata is found in mesic riparian areas, wet meadows, and wetland edges.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: North-Central Appalachian Large River Floodplain

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants are a significant threat to the host plants Lysimachia terrestris and L. ciliata.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive plants at sites where any Macropis species, or Epeoloides pilosula, is found.

Objective: At each site, work with land owners/managers to survey invasive plants, create a management plan, and carry out the plan.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of landowners engaged, number of plans written, and number of plans executed.

Potential Collaborators: Businesses, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Macropis ciliata, M. nuda, M. patellata, Epeoloides pilosula, Lysimachia quadrifolia, L. terrestris, L. ciliata.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Icy Miner Bee

Andrena algida

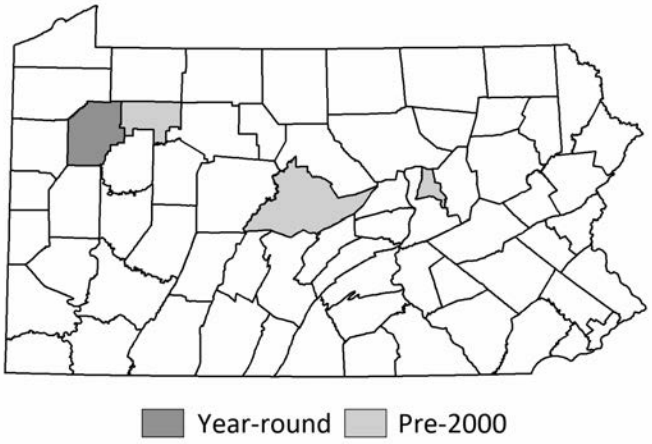
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open habitats with a variety of native wildflowers.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha. .

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Regular Miner Bee

Andrena regularis

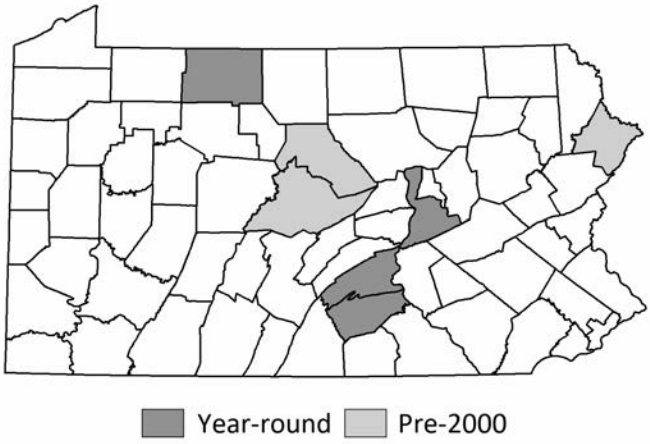
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



H. Holm

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain the known populations through 2035, and continue to improve our knowledge of the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: nests in hard-packed ground, often near orchards or blueberry patches

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, is vulnerable to neonicotinoid exposure.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicontinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	General bee surveys across the state are needed to improve our knowledge of the distribution and status of this uncommonly collected generalist bee. These surveys should be coordinated with the Pennsylvania Bee Monitoring Program.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Wheeler's Miner Bee

Andrena wheeleri

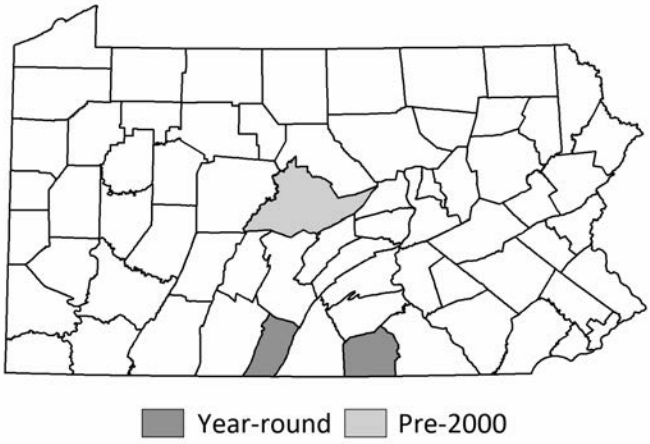
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and continue to improve our knowledge of the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Uses a variety of mostly open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Planting gas and electric rights-of-way in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Work with utility companies and private landowners to plant ROWs with native, pollinator-friendly plants, and maintain these area (by mowing regime, invasive plant management, etc.) to provide habitat for pollinators.

Objective: Identify ten priority ROW sites, create management plans, and carry out plantings and maintenance.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of sites and acreage of native plantings

Potential Collaborators: Businesses, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Distant Miner Bee

Andrena distans

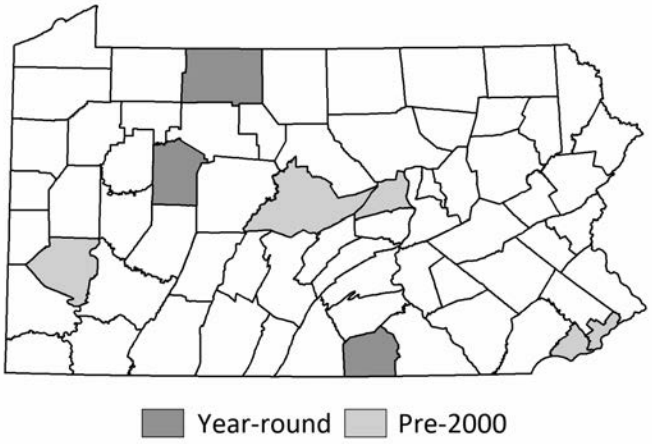
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



H. Holm

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: maintain current populations, and improve our knowledge of this bee's distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on wild geranium (Geranium maculatum).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: The host of this bee, wild geranium (Geranium maculatum), can be displaced by invasive plants.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: At sites where this bee occurs, evaluate the population of wild geraniums and initiate a control program for any invasive plants that are a threat.

Objective: Conduct surveys for this bee at at least 50 sites with wild geranium, distributed across the state, evaluating invasive plants and other threats wherever the bee is found. Identify ten priority sites for invasive plant control. Write management plans for invasive plant control, and carry out plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: percent control of invasive plants at each site; continued presence of the bee at each site.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action:

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Bearded Miner Bee

Andrena barbilabris

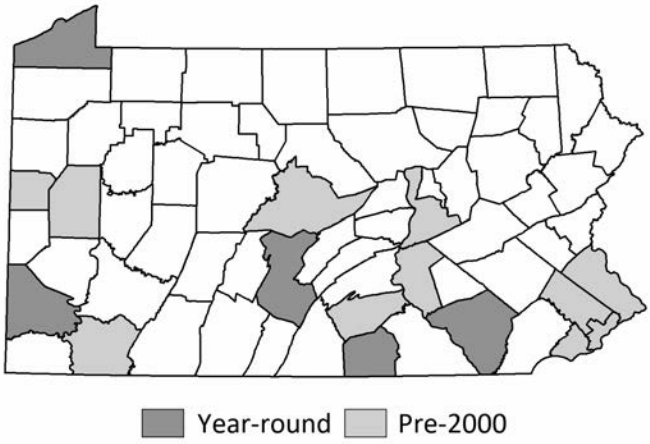
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Cools

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: open habitat with sandy soils

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Bee surveys are needed in sandy soils throughout the state to improve our knowledge of the distribution and status of this bee.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Clark's Miner Bee

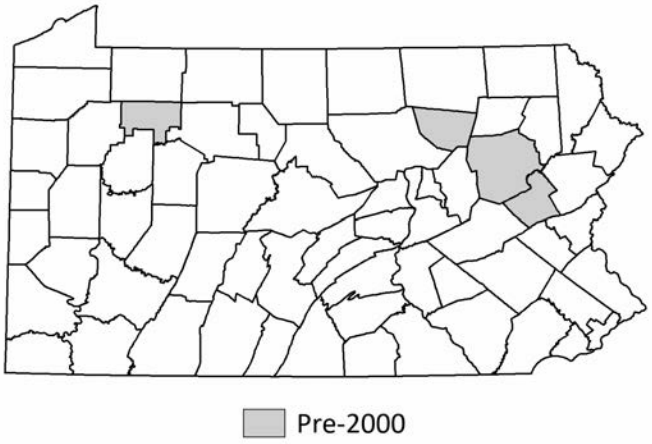
Andrena clarkella

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on willows (Salix spp.)

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Wet Meadow-Shrub Swamp

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Developments often encroach on wetlands and riparian corridors, removing important habitats.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore wetland edges and riparian areas with tree plantings, incorporating willows (Salix spp.) as a major component.

Objective: Plant willows at 20 wetland restoration sites.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of sites enhanced with willow plantings

Potential Collaborators: Delaware River Basin Commission, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Eastern Willow Miner Bee (Andrena bisalicis), Clark's Miner Bee (Andrena clarkella), Red-bellied Miner Bee (Andrena erythrogaster), Cold Miner Bee (Andrena frigida), Macoupin County Miner Bee (Andrena macoupinensis), Maria Miner Bee (Andrena mariae), a mining bee (Andrena nida), Black Miner Bee (Andrena nigrae), Small Willow Miner Bee (Andrena salictaria), Sigmund's Miner Bee (Andrena sigmundi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Red-bellied Miner Bee

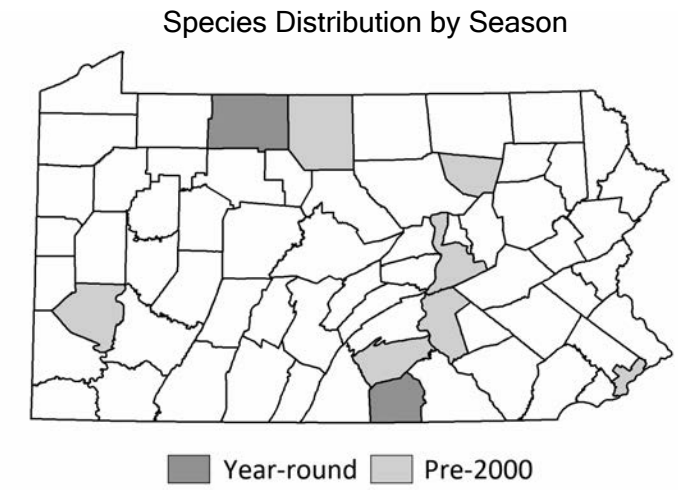
Andrena erythrogaster

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



E. B



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the species' distribution

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on willows (Salix spp.)

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Wet Meadow-Shrub Swamp

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Developments often encroach on wetlands and riparian corridors, removing important habitats.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore wetland edges and riparian areas with tree plantings, incorporating willows (Salix spp.) as a major component.

Objective: Plant willows at 50 wetland restoration sites.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of sites planted with willows

Potential Collaborators: Businesses, Delaware River Basin Commission, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Eastern Willow Miner Bee (Andrena bisalicis), Clark's Miner Bee (Andrena clarkella), Red-bellied Miner Bee (Andrena erythrogaster), Cold Miner Bee (Andrena frigida), Macoupin County Miner Bee (Andrena macoupinensis), Maria Miner Bee (Andrena mariae), a mining bee (Andrena nida), Black Miner Bee (Andrena nigrae), Small Willow Miner Bee (Andrena salictaria), Sigmund's Miner Bee (Andrena sigmundi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Cold Miner Bee

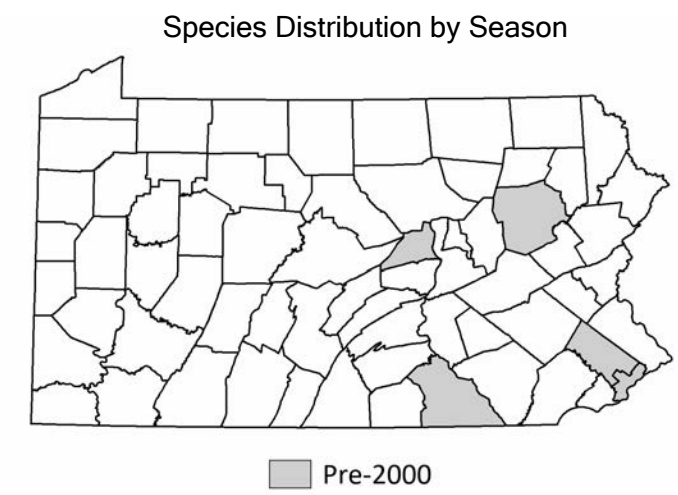
Andrena frigida

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



tprario



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on willows (Salix spp.)

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Developments often encroach on wetlands and riparian corridors, removing important habitats.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore wetland edges and riparian areas with tree plantings, incorporating willows (Salix spp.) as a major component.

Objective: Plant willows at 50 wetland restoration sites.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of sites enhanced with willow plantings

Potential Collaborators: Businesses, Delaware River Basin Commission, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Eastern Willow Miner Bee (Andrena bisalicis), Clark's Miner Bee (Andrena clarkella), Red-bellied Miner Bee (Andrena erythrogaster), Cold Miner Bee (Andrena frigida), Macoupin County Miner Bee (Andrena macoupinensis), Maria Miner Bee (Andrena mariae), a mining bee (Andrena nida), Black Miner Bee (Andrena nigrae), Small Willow Miner Bee (Andrena salictaria), Sigmund's Miner Bee (Andrena sigmundi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Macoupin County Miner Bee

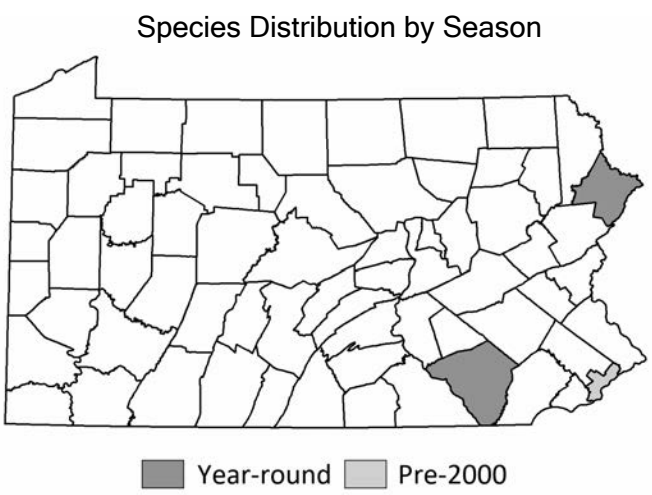
Andrena macoupinensis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on willows (Salix spp.)

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Developments often encroach on wetlands and riparian corridors, removing important habitats.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: When restoring wetland edges and riparian areas with tree plantings, incorporate willows (Salix spp.) as a major component.

Objective: Plant willows at 50 wetland restoration sites.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of sites planted with willows.

Potential Collaborators: Delaware River Basin Commission, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Eastern Willow Miner Bee (Andrena bisalicis), Clark's Miner Bee (Andrena clarkella), Red-bellied Miner Bee (Andrena erythrogaster), Cold Miner Bee (Andrena frigida), Macoupin County Miner Bee (Andrena macoupinensis), Maria Miner Bee (Andrena mariae), a mining bee (Andrena nida), Black Miner Bee (Andrena nigrae), Small Willow Miner Bee (Andrena salictaria), Sigmund's Miner Bee (Andrena sigmundi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Maria Miner Bee

Andrena mariae

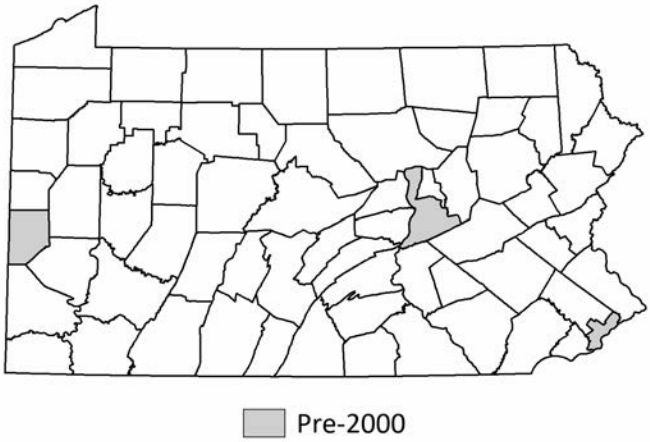
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



H. Holm

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine if this species is still present in the state, by surveying bees on willows throughout PA.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on willows (Salix spp.)

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Wet Meadow-Shrub Swamp

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Developments often encroach on wetlands and riparian corridors, removing important habitats.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: When restoring wetland edges and riparian areas with tree plantings, incorporate willows (Salix spp.) as a major component.

Objective: Plant willows at 50 wetland restoration sites.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of sites enhanced with willow plantings

Potential Collaborators: Delaware River Basin Commission, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Eastern Willow Miner Bee (Andrena bisalicis), Clark's Miner Bee (Andrena clarkella), Red-bellied Miner Bee (Andrena erythrogaster), Cold Miner Bee (Andrena frigida), Macoupin County Miner Bee (Andrena macoupinensis), Maria Miner Bee (Andrena mariae), a mining bee (Andrena nida), Black Miner Bee (Andrena nigrae), Small Willow Miner Bee (Andrena salictaria), Sigmund's Miner Bee (Andrena sigmundi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

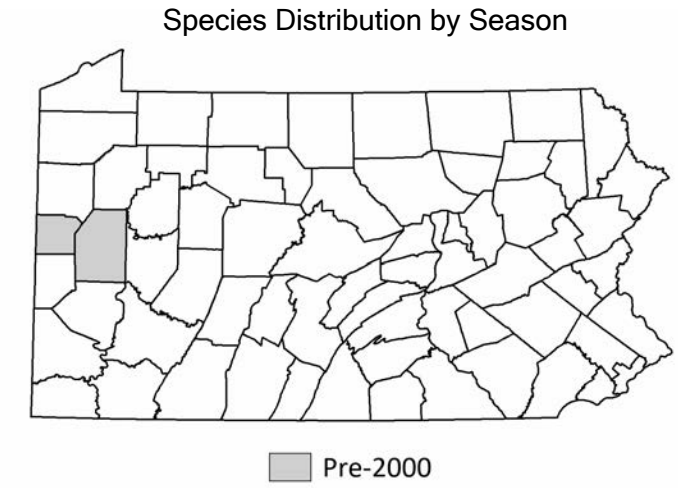
A mining bee

Andrena nida

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still in Pennsylvania, by surveying bees on willows throughout the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on willows (Salix spp.)

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Wet Meadow-Shrub Swamp

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Agriculture often encroaches on wetlands and riparian corridors, removing important habitats.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: When restoring wetland edges and riparian areas with tree plantings, incorporate willows (Salix spp.) as a major component.

Objective: Plant willows at 50 wetland restoration sites.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of sites planted with willows

Potential Collaborators: Businesses, Delaware River Basin Commission, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Eastern Willow Miner Bee (Andrena bisalicis), Clark's Miner Bee (Andrena clarkella), Red-bellied Miner Bee (Andrena erythrogaster), Cold Miner Bee (Andrena frigida), Macoupin County Miner Bee (Andrena macoupinensis), Maria Miner Bee (Andrena mariae), a mining bee (Andrena nida), Black Miner Bee (Andrena nigrae), Small Willow Miner Bee (Andrena salictaria), Sigmund's Miner Bee (Andrena sigmundi)

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A mining bee

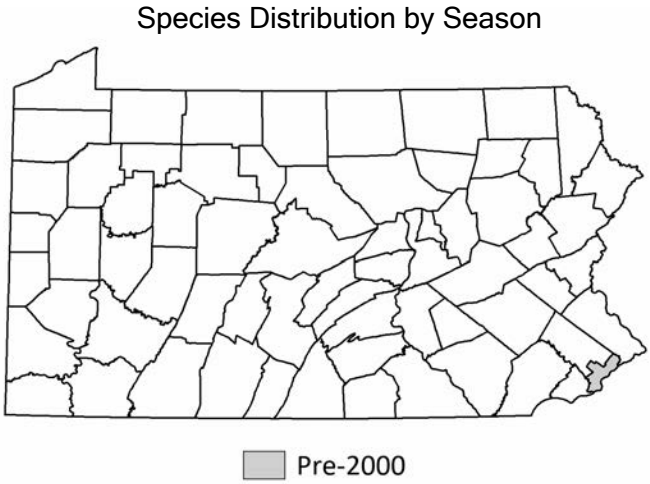
Protandrena abdominalis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in Pennsylvania, by inventorying bees on large plantings of spotted beebalm (Monarda punctata).

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Meadows and other open habitats. At this point, if the bee is still here, it would probably be restricted to plantings of Monarda punctata.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Very High - Medium

Specific Threat: This bee exclusively uses Monarda punctata as a pollen source. Wild populations of this plant are extirpated in Pennsylvania, but is commonly planted. Populations of pollen-specialist bees may be able to persist in residential landscapes, using cultivated plants, but these populations are at the whim of landowners who may eliminate plantings. High levels of pesticide use can prevent specialist bees from surviving.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Provide technical expertise to help legislators to craft legislation to (1) monitor where pesticides are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

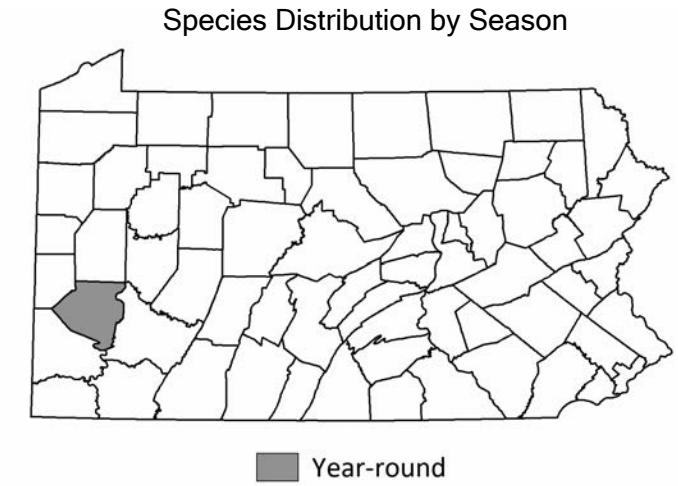
A mining bee

Andrena duplicata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and continue to improve our knowledge of the distribution of this species, by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Meadows and wet meadows with beggars' ticks (Bidens spp.) and other wildflowers in the aster family.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadways in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators. Be sure the seed mix includes beggars' ticks (Bidens spp.), which this species specializes on.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Small Willow Miner Bee

Andrena salictaria

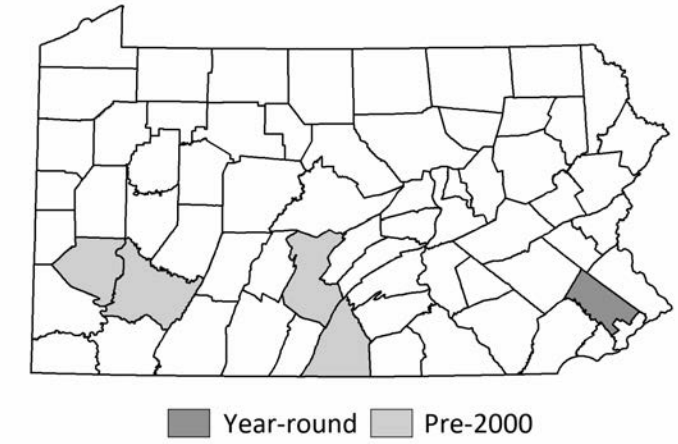
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



USGS Bee Inventory and Monitoring Lab

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on willows (Salix spp.)

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Wet Meadow-Shrub Swamp

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Developments often encroach on wetlands and riparian corridors, removing important habitats.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: When restoring wetland edges and riparian areas with tree plantings, incorporate willows (Salix spp.) as a major component.

Objective: Plant willows at 50 wetland restoration sites.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of sites planted with willows

Potential Collaborators: Delaware River Basin Commission, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Eastern Willow Miner Bee (Andrena bisalicis), Clark's Miner Bee (Andrena clarkella), Red-bellied Miner Bee (Andrena erythrogaster), Cold Miner Bee (Andrena frigida), Macoupin County Miner Bee (Andrena macoupinensis), Maria Miner Bee (Andrena mariae), a mining bee (Andrena nida), Black Miner Bee (Andrena nigrae), Small Willow Miner Bee (Andrena salictaria), Sigmund's Miner Bee (Andrena sigmundi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Sigmund's Miner Bee

Andrena sigmundi

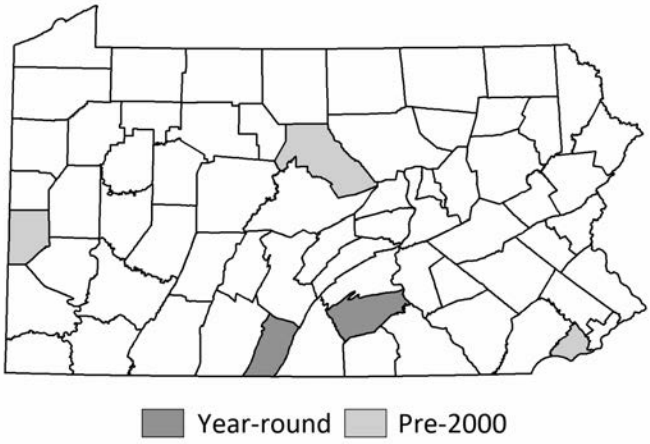
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



benfrankclegg

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: A pollen specialist on willows (Salix spp.)

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Developments often encroach on wetlands and riparian corridors, removing important habitats.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: When restoring wetland edges and riparian areas with tree plantings, incorporate willows (Salix spp.) as a major component.

Objective: Plant willows at 50 wetland restoration sites.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of sites planted in willow

Potential Collaborators: Businesses, Delaware River Basin Commission, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Eastern Willow Miner Bee (Andrena bisalicis), Clark's Miner Bee (Andrena clarkella), Red-bellied Miner Bee (Andrena erythrogaster), Cold Miner Bee (Andrena frigida), Macoupin County Miner Bee (Andrena macoupinensis), Maria Miner Bee (Andrena mariae), a mining bee (Andrena nida), Black Miner Bee (Andrena nigrae), Small Willow Miner Bee (Andrena salictaria), Sigmund's Miner Bee (Andrena sigmundi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Yellow-faced Miner Bee

Andrena aliciae

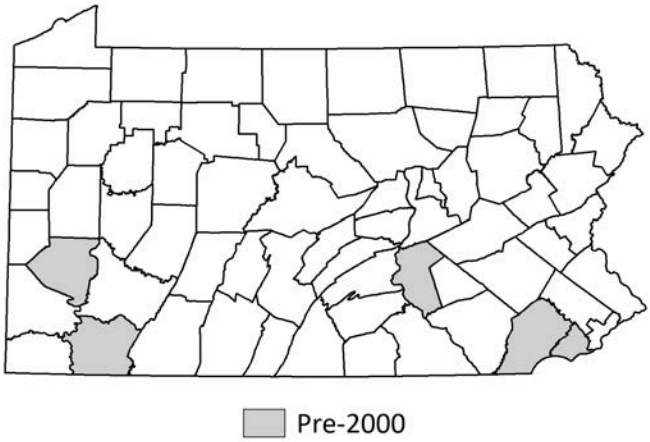
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



ComoHabita

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine if this species is still present in the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on sunflowers (Helianthus spp.), and probably other Asteraceae

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, is vulnerable to neonicotinoid exposure.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Total amount of neonicotinoid pesticides applied annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Bee surveys on sunflowers (Helianthus spp.) are needed across the state to improve our knowledge of the bee's distribution.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Waterleaf Miner Bee

Andrena geranii

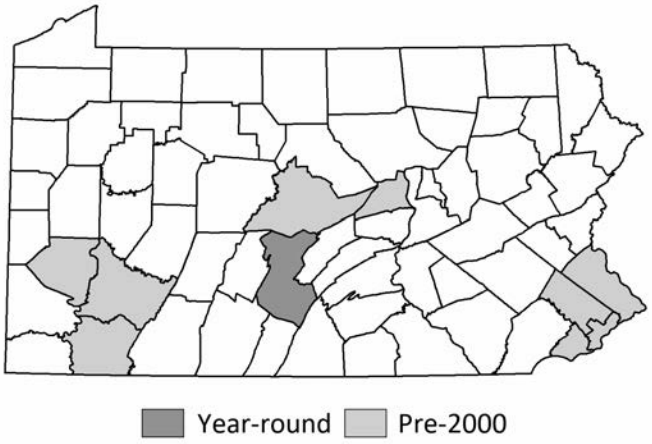
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



H. Holm

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Pollen specialist on waterleaf (Hydrophyllum spp.), which tend to grow in rich mesic soils.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: The rich mesic forests used by this bee are threatened by invasive plants such as garlic mustard, Japanese stilt grass, lesser celandine, Japanese barberry, and others.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: At sites where this bee occurs, evaluate populations of waterleaf (Hydrophyllum spp.), and control invasive plants where they threaten the waterleaf.

Objective: Conduct surveys for this bee at at least 50 sites with waterleaf (Hydrophyllum spp.), distributed across the state, evaluating invasive plants and other threats wherever the bee is found. Identify ten priority sites for invasive plant control. Write management plans for invasive plant control, and carry out plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Number of populations evaluated; number of weed management plans carried out.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Canada waterleaf (Hydrophyllum canadense), Virginia waterleaf (Hydrophyllum virginanum), and appendaged waterleaf (Hydrophyllum appendiculatum).

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A cemolobus bee

Cemolobus ipomoeae

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



D. Gilbert

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on bigroot morning-glory (Ipomoaea pandurata), a plant of open places and edges.

Primary Habitat: Open Upland

Primary Habitat Type: Agriculture: Cropland/Pastures

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, is vulnerable to neonicotinoid exposure.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicontinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Bee surveys focused on bigroot morning-glory (Ipomoea pandurata) are needed to improve our knowledge of the distribution and status of this rarely collected pollen specialist bee. Surveys should be coordinated with the Pennsylvania Bee Monitoring Project.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

References

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Splendid Sweat Bee

Agapostemon splendens

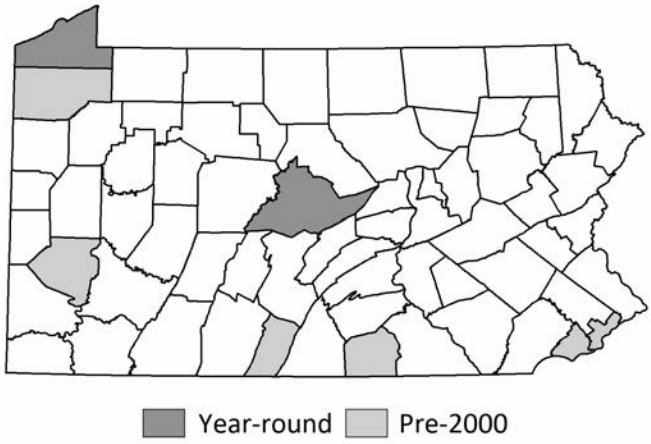
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



F. Clarke

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and increase our knowledge of the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Restricted to sandy soils.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Create, amend, or influence legislation, regulation, or codes

Specific Action: The Pennsylvania legislature should consider restrictions on the use of neonicotinoids in residential and agricultural settings.

Objective: Work with legislators to craft legislation to (1) monitor where pesticies are applied, and how much pesticide is applied, and (2) limit the use of neonicotinoids in the state.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Monitor the total amount of each pesticide that is used in the state (this may also require legislative action).

Potential Collaborators: Pennsylvania Biological Survey, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Nearly all pollinators, and most arthropods in general, that occur in residential or agricultural settings, would benefit.

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Mitigate human environmental impact

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM).

Objective: Minimize toxic chemical use to the greatest extent practicible.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Bee surveys in open habitats with very sandy soils are needed to better understand the distribution and status of this polylectic bee. Surveys should be coordinated with the Pennsylvania Bee Monitoring Program.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A melittid bee

Melitta melittoides

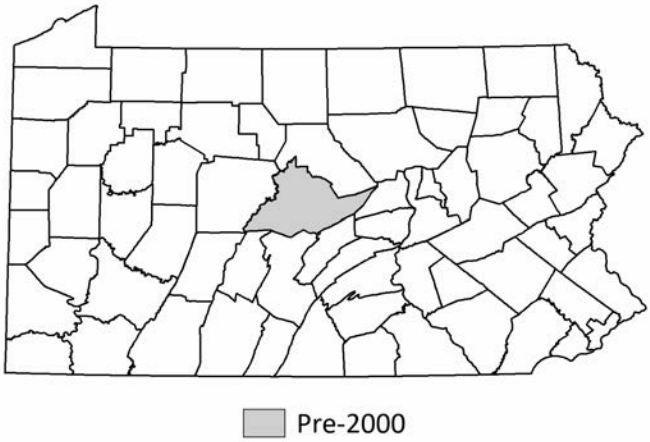
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Jacobson

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by inventorying bees at Lyonia patches across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This bee is a specialist on maleberry (Lyonia ligustrina), which grows in wet thickets and sometimes drier shrublands.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: The host plant can be displaced by invasive shrubs, such as bush honeysuckles (Lonicera spp.), Asian bittersweet (Celastrus orbiculatus), Multiflora rose (Rosa multiflora), and others

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: At sites occupied by the bee, evaluate populations of maleberry, and if they are threatened by invasive plants, then initiate management of those plants.

Objective: Survey for this bee at fifty sites with Lyonia spp. (maleberry), and at each site that supports the bee, evaluate to determine whether the plants are threatened by invasive species. Select up to ten priority sites for management. Work with landowners to write and carry out a management plan for invasive plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** number of populations evaluated, area of invasives treated.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Many native plants, and the animals that depend on them, would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Evening Primrose Sweat Bee

Lasioglossum oenotherae

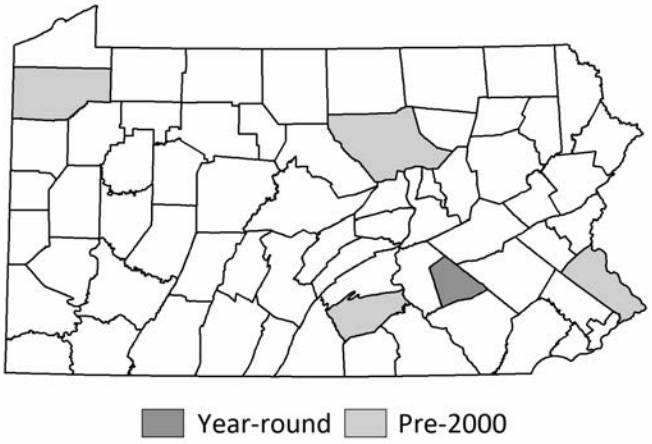
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Burnham

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on evening primroses (Oenothera spp.), which grow in open disturbed areas.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Use of pesticides (especially neonicotinoids) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM). The choice of whether to use neonicotinoid-treated seed should be guided by IPM principles.

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following see SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Williston's Plasterer Bee

Colletes willistoni

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Hardy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on groundcherries (Physalis spp.), which grow in open habitats and edges.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Conversion of natural areas to residential and other development generally reduces the availability of a wide variety of pollen and nectar sources. Oligolectic and monlectic bee species, such as this one, can be strongly affected by decline of a single genus or species of host plant. This genus of bee in particular has been negatively associated with urbanization (Quinlan et al, 2023). Pesticides used in residential landscaping can be a serious threat to native bees in these settings.

Action Category: Outreach, communication and distribution

Specific Action: Reduce pesticide use in residential neighborhoods. These habitats can be a viable habitat for the Williston's Plasterer Bee, if the host plant is planted and if pesticides are not used.

Objective: Educate gardeners about the risks of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** number of gardeners contacted

Potential Collaborators: Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Physiographic Province: Ridge and Valley. Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: A wide variety of bees, butterflies, moths, other pollinators, and other insects.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Sweatbee-like Miner Bee

Perdita halictoides

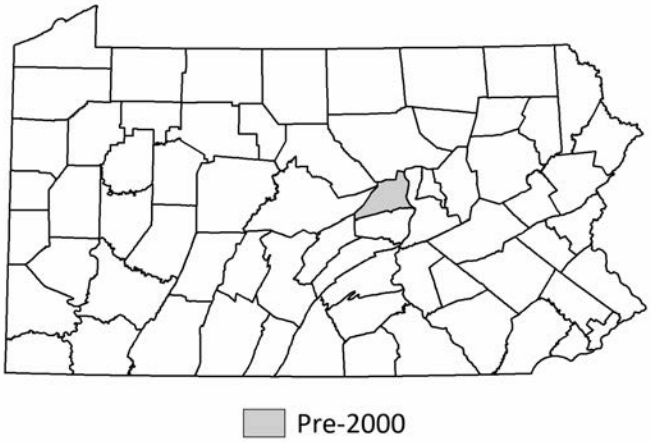
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Jacobson

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Old fields and other open habitats with sandy soils

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plants of this specialist moth specialize in open dry habitats, which are easily invaded by species such as knapweed (Centaura spp) which displace native plants.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: At sites where the bee occurs, identify habitats where groundcherries (Physalis spp.) grow, and manage invasive plants that are encroaching on the habitat.

Objective: Evaluate invasive plants at sites where there are known extant populations of the bee (there is only 1 known site at the time of this writing). Work with landowners to write and carry out management for invasive plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Number of populations evaluated; number of weed management plans carried out.

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Ground-cherry Plasterer Bee (Colletes latitarsis), Williston's Plasterer Bee (Colletes willistoni), Two-spotted Cuckoo Nomad Bee (Epeolus bifasciatus), a sweat bee (Lasioglossum pectinatum), and Sweatbee-like Miner Bee (Perdita halictoides)

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys at sites with groundcherries (Physalis spp.) are needed across the state to understand the distribution of 5 bees that rely on this host plant.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pickerelweed Long-horned Bee

Melissodes apicata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: This bee is a pollen specialist on pickerelweed (Pontederia cordata), which grows in emergent marshes.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plant of this bee grows in emergent marshes, which are threatened by invasion of common reed (Phagmites australis) and narrow-leaved cattail (Typha angustifolia).

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: At sites where this bee occurs, evaluate the populations of pickerelweed (Pontederia cordata), and control invasive plants where they threaten the pickerelweed.

Objective: Currently, one extant population of the bee is known in Pennsylvania. That site should be evaluated to determine whether pickerelweed there is threatened by invasive plants. If so, steps should be taken to control the invasive plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Has site been evaluated? Percent control of target weeds at site.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: Piedmont

Other species likely to benefit from this action: Many plants and animals of freshwater emergent marshes would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rose Miner Bee

Andrena melanochroa

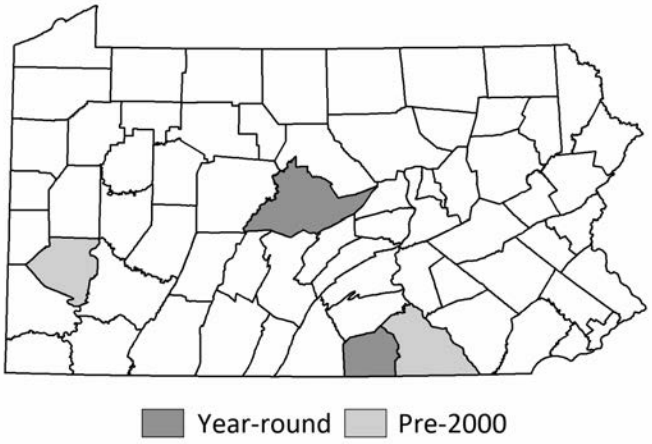
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Hardy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: forages on strawberries and other plants in the rose family; open habitats and forests

Primary Habitat: Open Upland

Primary Habitat Type: Agriculture: Cropland/Pastures

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, is vulnerable to neonicotinoid exposure.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Total amount of neonicotinoid pesticides applied annually in Pennsylvania.

Potential Collaborators: Other state agency, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Bee surveys on plants in the rose family, especially on Fragaria, Potentilla, and Rubus, are needed to improve our knowledge of the distribution and status of this bee.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Peaceful Miner Bee

Andrena placata

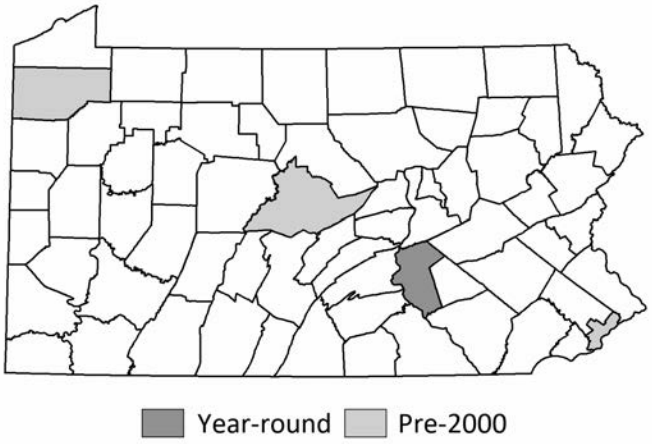
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



T. Royal

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and continue to improve our understanding of the distribution of this species in the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on goldenrods (Solidago spp.)

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Goldenrod Plasterer Bee

Colletes solidaginis

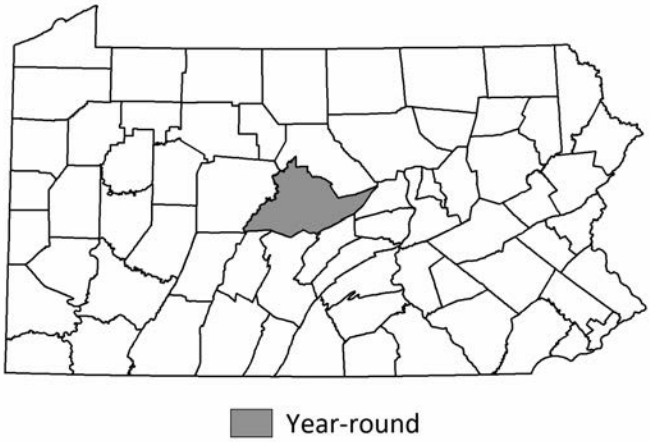
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



dleaon1

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain the known population, and improve our understanding of the distribution of this species in the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A pollen specialist on goldenrods (Solidago spp.), this bee also requires open sandy soils for nesting.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Low

Specific Threat: Fire suppression resulting in canopy closure and reduced access to open sandy soils.

Action Category: Manage non-living habitat components

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality and allow recolonization of sensitive species.

Objective: Many insects use early successional habitats like meadows, grasslands, and barrens that require periodic disturbance to keep them open. Some of these species have eggs, larva, and pupae that are especially vulnerable to fire. Conduct baseline inventories to determine where these species occur. Develop and update management plans to include best practices that reduce negative impacts to fire sensitive species. Use prescribed fire and/or mowing to maintain a mosaic of vegetation structure that includes woodlands, shrublands, and low grassy/forb openings. Define the core habitat for each species of concern based on the habitat subtypes and host plants they utilize. Burn or mow no more than a quarter of their core habitats in a year. Delineate and protect sections of core habitat as refugia during management. Make some management units permanent fire refugia, where fire is never deliberately applied. Expand the core habitat by restoring adjacent areas that have succeeded into forest.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of prescribed burn plans written, which specifically incorporated the needs of invertebrate SGCN.

Potential Collaborators: Pennsylvania Game Commission

Locations: Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

American Plasterer Bee

Colletes americana

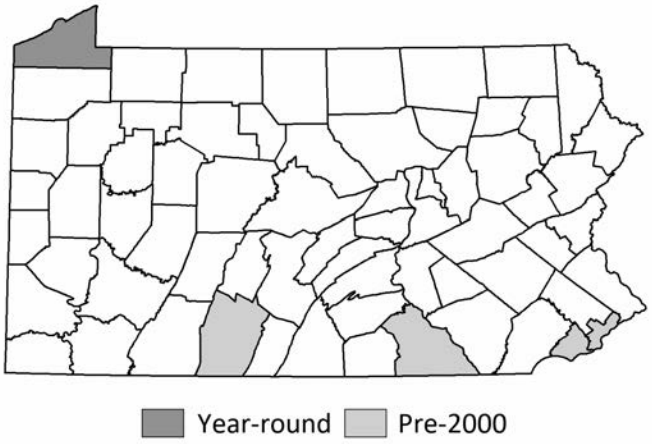
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Walsh

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: This generalist bee uses a wide variety of flowers as nectar and pollen sources.

Primary Habitat: Open Upland

Primary Habitat Type: Shrublands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Conversion of natural areas to residential and other development generally reduces the availability of a wide variety of pollen and nectar sources. Oligolectic and monlectic bee species, such as this one, can be strongly affected by decline of a single genus or species of host plant. This genus of bee in particular has been negatively associated with urbanization (Quinlan et al, 2023). Pesticides used in residential landscaping can be a serious threat to native bees in these settings.

Action Category: Outreach, communication and distribution

Specific Action: Reduce pesticide use in residential neighborhoods. These habitats can be a viable habitat for the many native bees if pesticides are not used.

Objective: Educate gardeners about the risks of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** number of gardeners contacted

Potential Collaborators: Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: A wide variety of bees, butterflies, moths, other pollinators, and other insects.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Compact Plasterer Bee

Colletes compactus

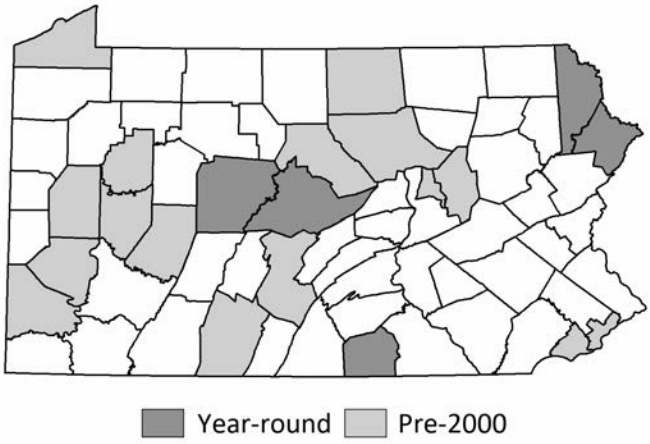
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



roamingthewoods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations, and improve our understanding of the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: open uplands

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Conversion of natural areas to residential and other development generally reduces the availability of a wide variety of pollen and nectar sources. Oligolectic and monlectic bee species, such as this one, can be strongly affected by decline of a single genus or species of host plant. This genus of bee in particular has been negatively associated with urbanization (Quinlan et al, 2023). Pesticides used in residential landscaping can be a serious threat to native bees in these settings.

Action Category: Outreach, communication and distribution

Specific Action: Reduce pesticide use in residential neighborhoods. These habitats can be a viable habitat for the Alumroot Cellophane Bee, if the host plant is planted and if pesticides are not used.

Objective: Educate gardeners about the risks of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** number of gardeners contacted

Potential Collaborators: Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Environmental Protection Agency, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: A wide variety of bees, butterflies, moths, other pollinators, and other insects.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

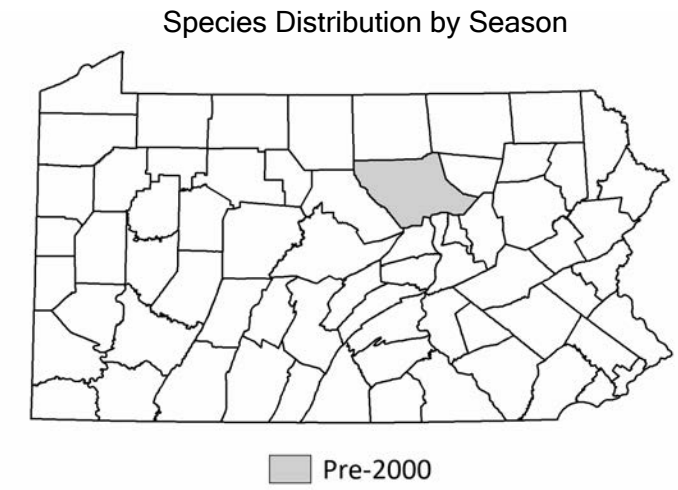
A yellow-masked bee

Hylaeus floridanus

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



R. Tyler



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Herbaceous, shrubby, and forested wetlands.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Specific Habitat Requirements: Herbaceous, shrubby, and forested wetlands.

Primary Habitat: Open Upland

Primary Habitat Type:

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Sanicle Yellow-faced Bee

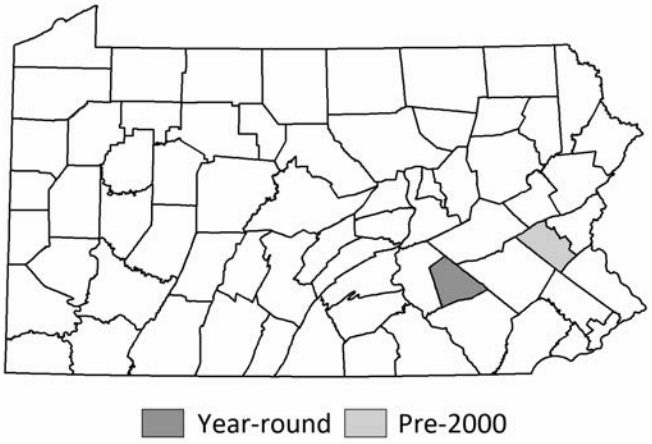
Hylaeus saniculae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in the state, by continuing general bee inventory efforts.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Agriculture: Cropland/Pastures

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	More general bee surveys across the state are needed to determine whether this bee still occurs in Pennsylvania.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Smallpox Sculptured Mason Bee

Heriades variolosus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



I. Bitterlich

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our knowledge of the distribution of this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: nests in pre-existing cavities in wood

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicontinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Physiographic Province: Piedmont, Ridge and Valley

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Lasioglossum foveolatum, Protandrena aestivalis, Agapostemon splendens, Megachile petulens.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	General bee surveys are needed across the state to better understand the status of this rarely collected generalist bee.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Carrot Yellow-faced Bee

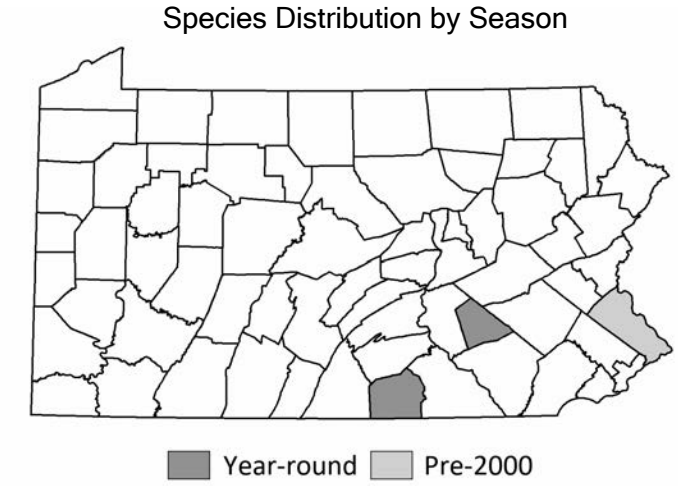
Hylaeus sparsus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Wilhelm



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this bee.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: A pollen specialist on purple meadow parsnip (Thaspium trifolium) and aniseroot (Osmorhiza longistylis), maybe also other Apiaceae (carrot family).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: The host plants of this bee can be excluded from forest and edge habitats by invasive plants.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: At sites where this bee occurs, evaluate populations of carrot family (Apiaceae) plants, and control invasive plants where they threaten the host plants.

Objective: Identify up to ten priority sites where this species occurs. At each site, identify threats to plants in the carrot family (Apiaceae), including invasive plant threats. Write management plans for invasive plant control, and carry out plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Percent control of invasive species achieved at each site

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Numerous invertebrates that rely on these plants and other native plants at these sites would benefit.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

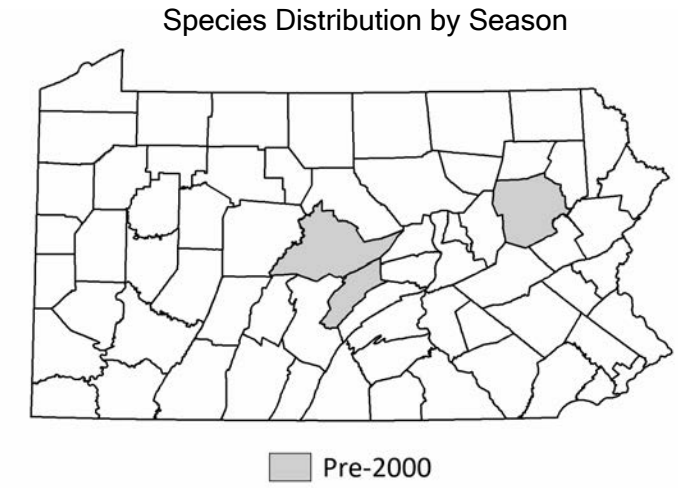
A miner bee

Andrena daeckei

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and continue to improve our understanding of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: May be a pollen specialist on heaths (Ericaceae).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Low

Specific Threat: Fire suppression resulting in canopy closure and reduction in heaths.

Action Category: Manage non-living habitat components

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality and allow recolonization of sensitive species.

Objective: Many insects use early successional habitats like meadows, grasslands, and barrens that require periodic disturbance to keep them open. Some of these species have eggs, larva, and pupae that are especially vulnerable to fire. Conduct baseline inventories to determine where these species occur. Develop and update management plans to include best practices that reduce negative impacts to fire sensitive species. Use prescribed fire and/or mowing to maintain a mosaic of vegetation structure that includes woodlands, shrublands, and low grassy/forb openings. Define the core habitat for each species of concern based on the habitat subtypes and host plants they utilize. Burn or mow no more than a quarter of their core habitats in a year. Delineate and protect sections of core habitat as refugia during management. Make some management units permanent fire refugia, where fire is never deliberately applied. Expand the core habitat by restoring adjacent areas that have succeeded into forest.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of prescribed burn plans written, which specifically incorporated the needs of invertebrate SGCN.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Foveolate Sweat Bee

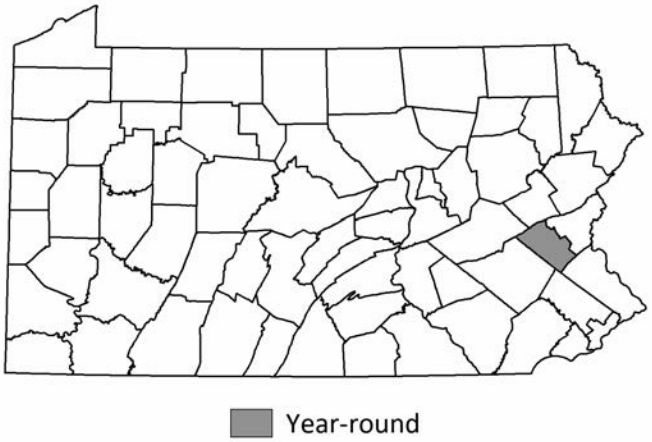
Lasioglossum foveolatum

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



M. Schoenitz

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to improve our knowledge of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: open habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Use of pesticides (especially neonicotinoids and glyphosate) in agriculture is a threat to native bees in general. This species, because of its flight period and host plant preferences, may be exposed to neonicotinoids and other pesticides.

Action Category: Outreach, communication and distribution

Specific Action: Reduce the use of pesticides (especially neonicotinoids) by promoting Integrated Pest Management (IPM)

Objective: Educate growers about how to calculate the costs, risks, and benefits of pesticide use, and the situations for which pesticide use is not appropriate.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** The amount of neonicotinoid pesticides used annually in Pennsylvania.

Potential Collaborators: Other state agency, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Any insect species that occurs in an agricultural setting will benefit. Examples include the following bee SGCNs: Hylaeus saniculae, Protandrena aestivalis, Agapostemon splendens, Megachile petulans.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	General bee surveys across the state are needed to better understand the status of this rarely collected generalist bee.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A cuckoo nomad bee

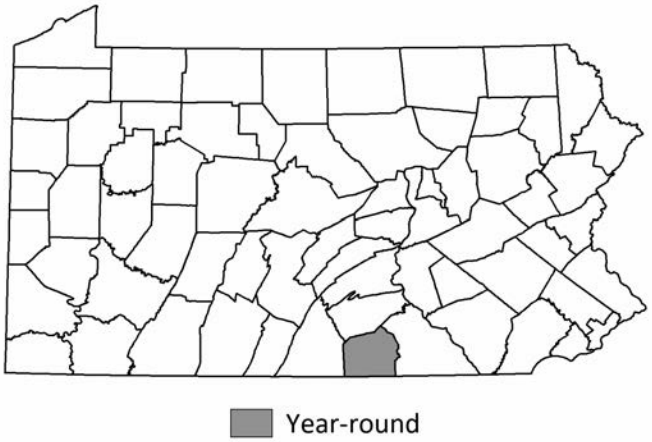
Nomada quadrimaculata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Improve our knowledge of the distribution of this species, by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Open to forested habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Private Landowners, Other state agency

Locations: Physiographic Province: Piedmont

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A cuckoo nomad bee

Nomada affabilis

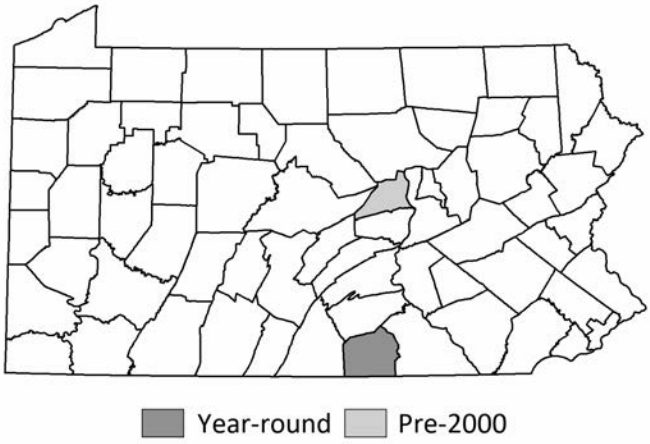
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Goetz

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This bee is a kleptoparasite of Eucera spp., which tend to forage in open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rightmeyer's Wee Cuckoo Bee

Nomada sp. MR 1

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Hardy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: The host of this kleptoparasite is unknown, but it is generally found in open habitats with diverse wildflowers.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus, Ridge and Valley

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

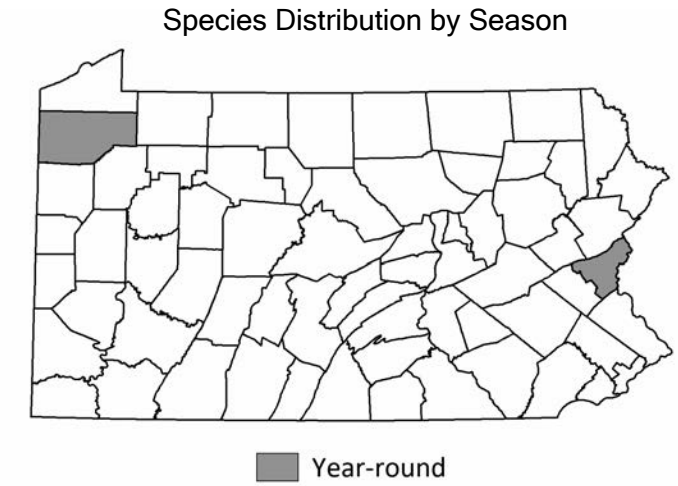
Funeral Cuckoo Leafcutter Bee

Coelioxys funeraria

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: kleptoparasites of leafcutter bees, most of which are generalists of open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Collector Cuckoo Nomad Bee

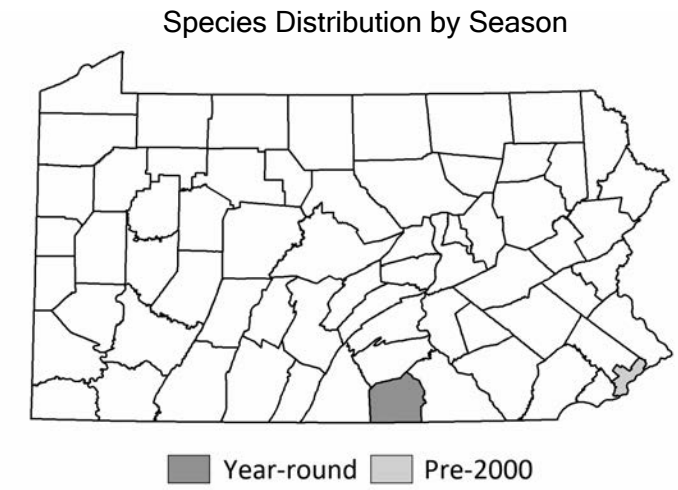
Epeolus lectoides

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Lucas



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This bee is a kleptoparasite of Colletes latitarsus (a pollen specialist on ground cherry (Physalis spp.)), C. nudus (a pollen generalist), and possibly others. So generally open habitats, especially if ground cherry is present.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pacific Cuckoo Bee

Melecta pacifica

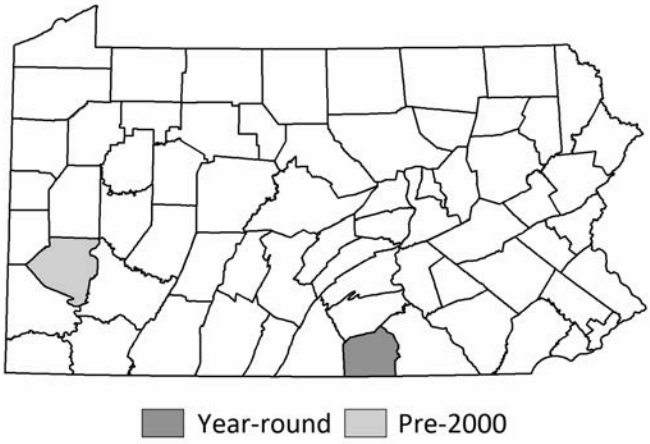
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. C

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This bee is a kleptoparasite of Anthophora spp., which nest in exposed banks of clayish soils and tend to forage in open habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Armed Cuckoo Nomad Bee

Nomada armatella

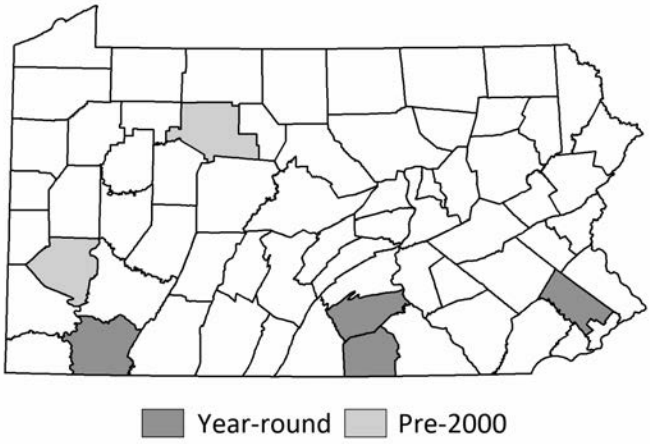
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Lucier

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: hardwood forests, mixed woodlands, suburban zones, and open sandy areas

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads

Threat Impact: Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Small Cuckoo Nomad Bee

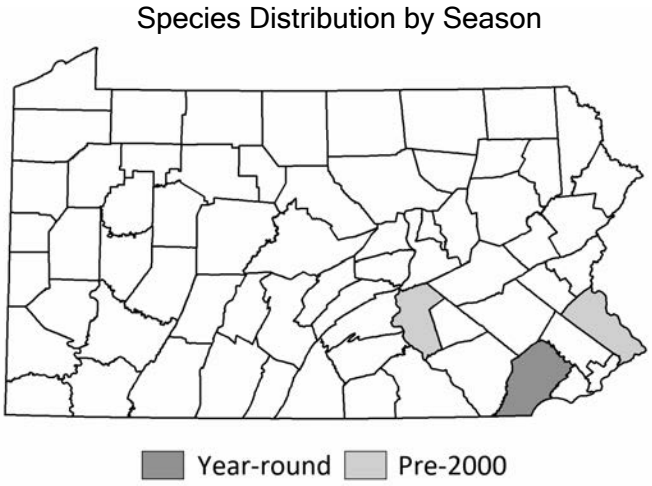
Nomada parva

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. McCarthy



Conservation Profile

PA 10-Year Conservation Goal: Maintain the known populations, and improve our knowledge of the species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This bee is a pollen generalist, and tends to nest in soils with sparse vegetation.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Townes's Cuckoo Sweat Bee

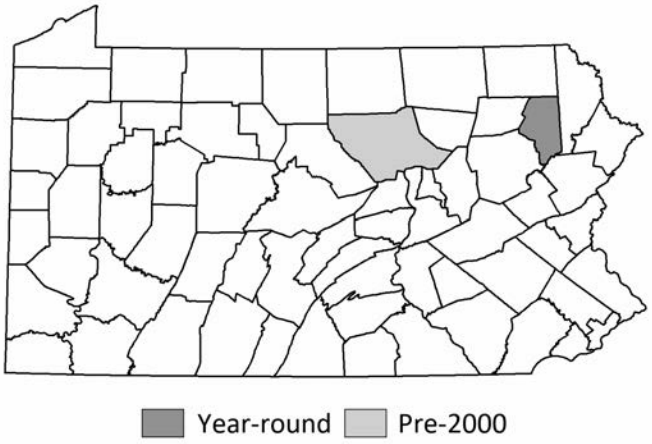
Sphecodes townesi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species by continuing bee inventory efforts across the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Open to forested habitats

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Constrained Cuckoo Carder Bee

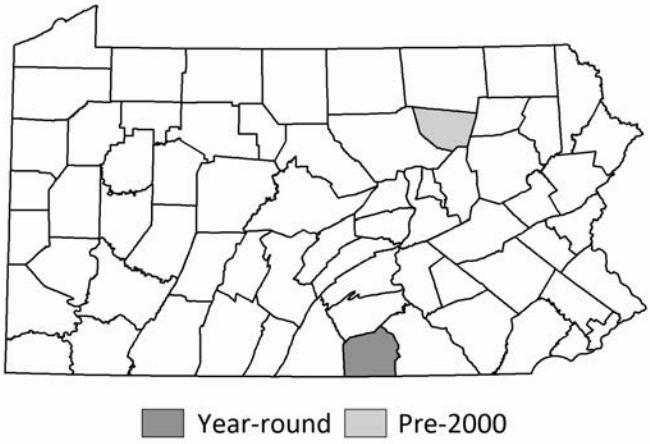
Stelis coarctatus

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



H. Holm

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the distribution of this species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: uses a variety of open and wooded habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Distinct Mason Bee

Osmia distincta

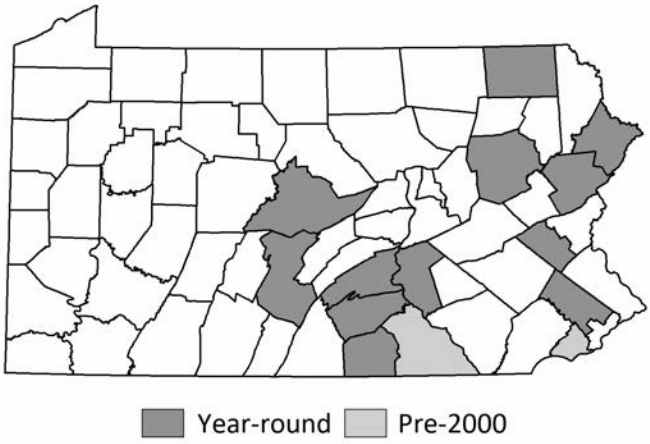
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



H. Holm

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Stabilize populations of species, which currently appears to be declining sharply. Improve our knowledge of the distribution of this species within Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 50-90%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: This bee is a pollen specialist on Penstemon spp., which grow in barrens, outcrops, edges, and gardens.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: All native Osmia spp in the region appear to be declining sharply after the introduction of exotic Osmia spp and the exotic chalkbrood fungi they carry.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium

Action Urgency: Initiate immediately

Measure: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Planting roadsides in grasses and invasive plants such as crown vetch (Coronilla varia) decreases the diversity of nectar and pollen sources. Controlling vegetation by herbicide spraying, or mowing during critical flowering times, also decreases diversity of nectar and pollen sources. Creation of new roads removes existing habitat, especially for forest bees, and fragments the habitat that remains. Alternatively, these early-successional habitats could be managed to improve habitat for native bees and other pollinators.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Plant roadsides with native, pollinator-friendly plants, and maintain these areas (by mowing regime, etc.) to provide habitat for pollinators.

Objective: Establish fifty 5-hectare test plots on PennDOT roadside land that is currently planted with grasses or less-desirable plants.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** -percent native cover in each plot, measured at 2-year intervals -frequency of adherence to planned mowing regime

Potential Collaborators: Other state agency, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: A wide variety of pollinators and other wildlife will benefit from this action. Some examples include the bees Andrena asteroides, Andrena chromotricha, Andrena clarkella, Andrena daeckei, and Andrena dimorpha.

Season: Year-round

Priority	Need	Partners
1	To better understand the epidemic of chalkbrood fungus (Ascosphaera spp.), which was introduced along with exotic mason bees (Osmia spp.) and which now appears to be decimating our native mason bees. Possible research questions: - Are there some species of native Osmia, or some regions of the state, or some habitats, which are less susceptible to the fungus? - Is the spread of the fungus driven more by human-mediated movement of mason bees or by natural dispersal of the bees? - Are there interventions that could be applied to managed Osmia colonies to make them less likely to spread the fungus to native bees? - Are there less virulent fungus strains that could compete with the more virulent strains?	Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	In addition to trap-nest surveys that work for mason bees in general, the Distinct Mason Bee can be found by targeted surveys at patches of Penstemons, the sole pollen source of this species. Surveys should be coordinated with the Pennsylvania Bee Monitoring Program.	Universities & research institutions
1	Trap-nesting surveys focused on mason bees (Osmia spp.) are urgently needed to better understand the rapidly changing status of our native mason bees. Surveys should be coordinated with the Pennsylvania Bee Monitoring Program.	Universities & research institutions

Name: Pennsylvania Bee Monitoring Program

Lead(s) : López-Uribe Lab at Pennsylvania State University

Link: https://lopezuribelab.com/pa-bee-monitoring/

Description: This program has trained a team of Master Gardeners to survey bees across Pennsylvania. Specimens are identified by experts and the data is incorporated into the growing database of Pennsylvania bee records. Surveys include repeated monitoring at focal sites, targeted surveys of specific host plants and high quality natural areas, and other surveys.

Comments: The program has not yet done surveys focused on mason bees (Osmia spp.) but that could be a future focus of monitoring efforts.

Monitoring Need: To improve knowledge of the distribution of all bee species within Pennsylvania, to detect changes in range and abundance, to be aware of newly introduced species, to better understand phenology, host plants, and community composition.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Common Roadside Skipper

Amblyscirtes vialis

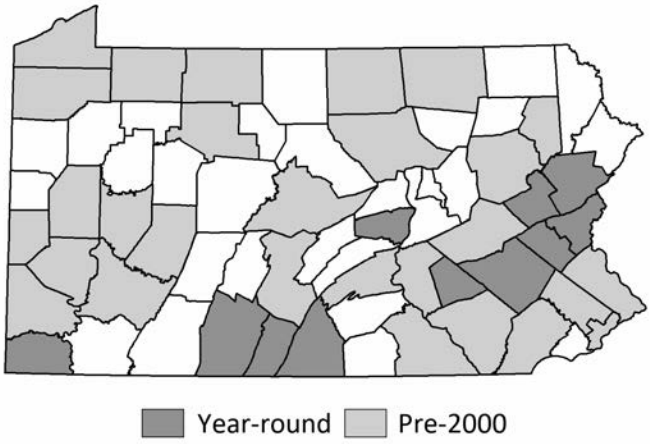
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Edges and clearings near or within woodlands, such as roadsides, barrens, and other dry, disturbed areas. Associated with a variety of grasses as host plants.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Encourage communication and share information between wildlife biologists, landowners / land managers, and utility companies

Objective: Facilitate communication between landowner/ land manager and utility companies to coordinate and adapt activities to optimize habitat for SGCN species while protecting utility resources. Share information on best practices for habitat management on right-of-ways to benefit SGCN insects and other wildlife.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open habitats composed of native grasses and forbs, and control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term management effort needed to control trees and invasive shrubs and plants. Herbicides should be used in the lowest volume and most targeted application method possible, to reduce negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

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Monroe, J. and D. Wright. 2017. Butterflies of Pennsylvania: A Field Guide. University of Pittsburgh Press, Pittsburgh, PA.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Falcate Orangetip

Anthocharis midea

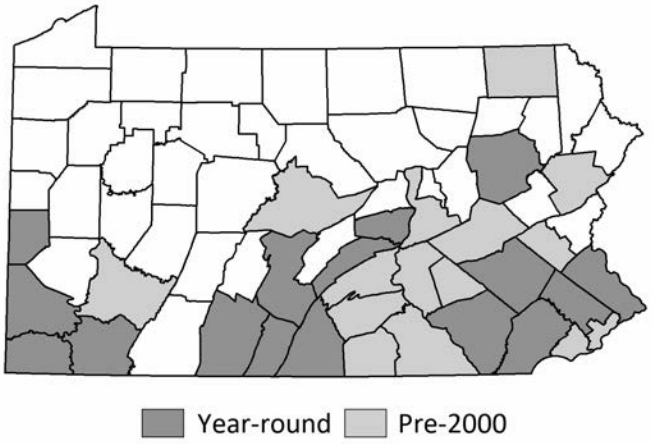
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Peplinski

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5?

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Openings within woodlands and forests. Host plants include many species in the mustard family (Cardamine, Arabis, Dentaria).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** # of sites with invasive species controlled with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium

Specific Threat: White-tailed deer pose a threat via over-browsing of critical resources like nectar plants and caterpillar food plants

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Dusted Skipper

Atrytonopsis hianna

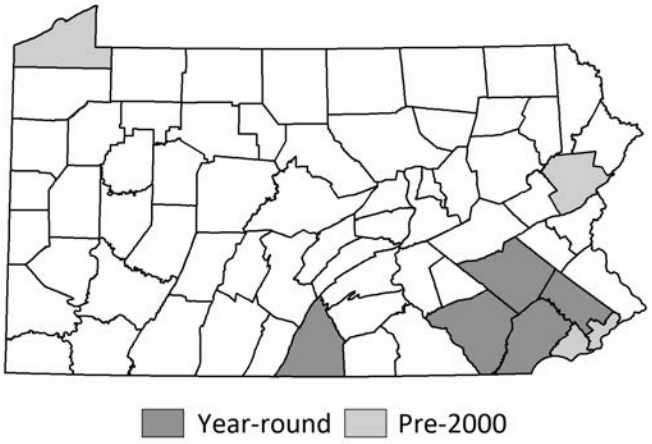
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Leppo

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Dry open fields, barrens, rocky outcrops, or anthropogenic habitats such as old fields and power-line right-of-ways. Host plants are bluestem grasses (Andropogon, Schizachyrium scoparius).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** High

Specific Threat: Loss of grassland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open habitats composed of native grasses and forbs, and control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Facilitate communication between landowner/ land manager and utility companies to coordinate and adapt activities to optimize habitat for SGCN species while protecting utility resources. Share information on best practices for habitat management on right-of-ways to benefit SGCN insects and other wildlife.

Objective: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years

Measure: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Silver-bordered Fritillary

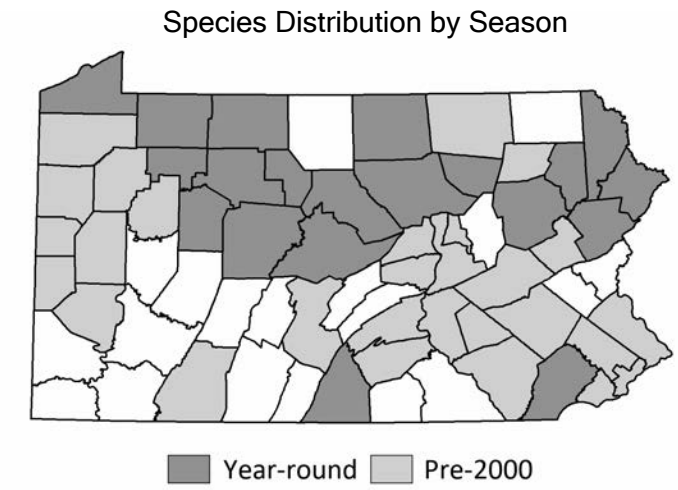
Boloria myrina

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Leppo



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Silver-bordered fritillary habitats include bogs, marshes, and wet meadows. The caterpillars feed on violets (Viola spp.) associated with wetland areas and adjacent uplands. Potential caterpillar host plants include marsh blue violet (Viola cucullata), northern white violet (V. pallens), striped violet (V. striata), primrose-leaf violet (V. primulifolia), and common blue violet (V. papilionacea) (Allen 1997).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

Allen, T. 1997. The Butterflies of West Virginia and Their Caterpillars. University of Pittsburgh Press, Pittsburgh.

PENNSYLVANIA WILDLIFE ACTION PLAN

Northern Metalmark

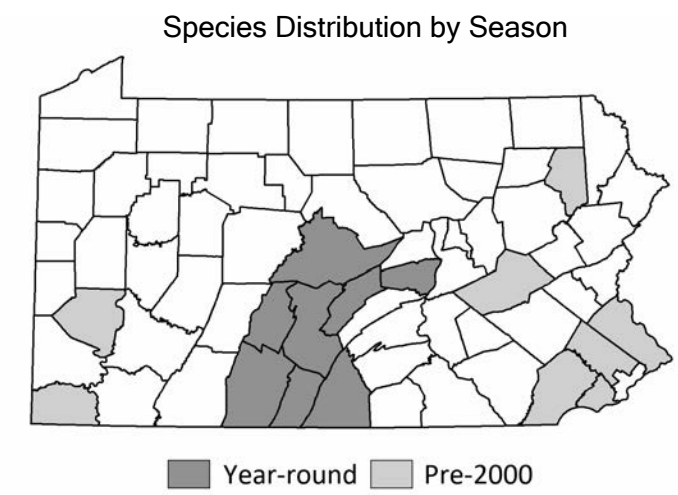
Calephelis borealis

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Openings within limestone woodlands. Host plant is round-leaved ragwort (Senecio obovatus).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Henry's Elfin

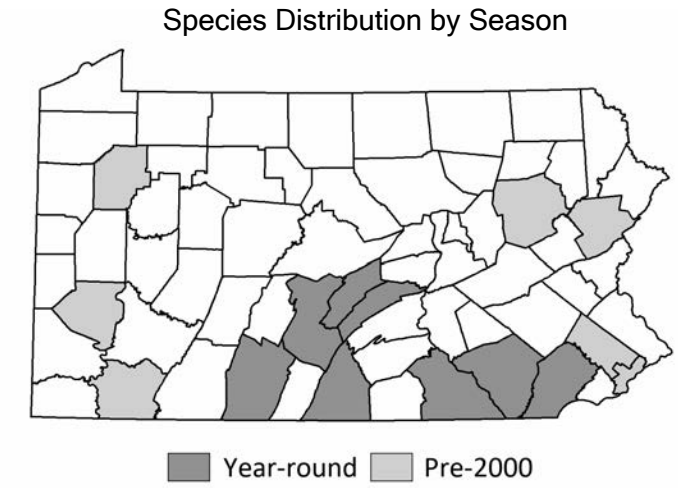
Callophrys henrici

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Found most often in acidic woodlands and forests, often with dense, brushy understories. Uses a wide variety of host plants, including--most commonly in PA--redbud (Cercis canadensis), but also American holly (Ilex opaca), and European buckthorn (Rhamnus.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Low

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium

Action Urgency: Initiate immediately

Measure: Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Frosted Elfin

Callophrys irus

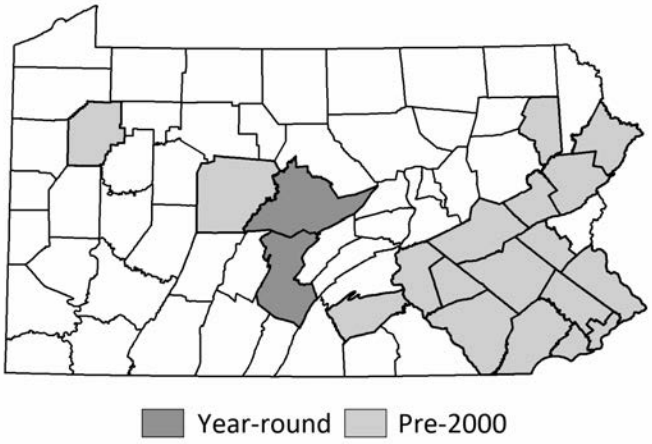
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Grassy openings with sandy or rocky soils, most commonly now in anthropogenic habitats such as powerline and railroad right-of-ways. Host plant is Baptisia (Baptisia tinctoria) in Pennsylvania, but uses wild lupine (Lupinus perennis) in other parts of its range.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Medium

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Encourage communication and share information between wildlife biologists, landowners / land managers, and utility companies

Objective: Facilitate communication between landowner/ land manager and utility companies to coordinate and adapt activities to optimize habitat for SGCN species while protecting utility resources. Share information on best practices for habitat management on right-of-ways to benefit SGCN insects and other wildlife.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Medium

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** # of sites with invasive species controlled with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open habitats composed of native grasses and forbs, and control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

Lamprinos, Matthew J., "Impact of whitetail deer overpopulation with hunting on the decline" (2021). English Department: Research for Change - Wicked Problems in Our World. 52.
Available at https://research.library.kutztown.edu/wickedproblems/52 (accessed June 2025).

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

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Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

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Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Hoary Elfin

Callophrys polios

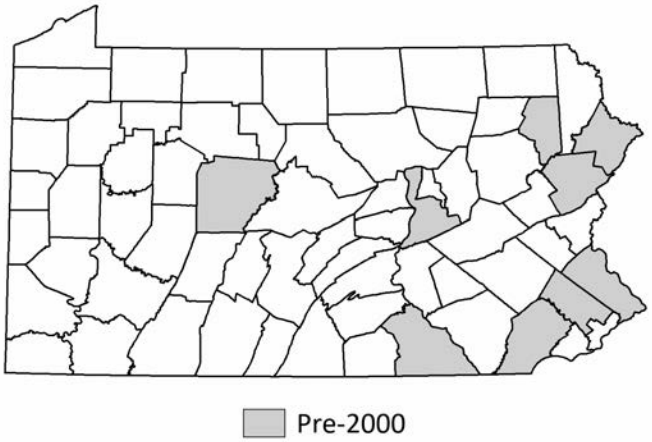
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Found mostly in heathland habitats, such as pine barrens, bog edges, and rocky ridges, in association with its host plants, either trailing arbutus (Epigaea repens) or bearberry (Arctostaphylos uva-ursi).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Loss of suitable habitat in Pennsylvania due to climate change.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Arctic Skipper

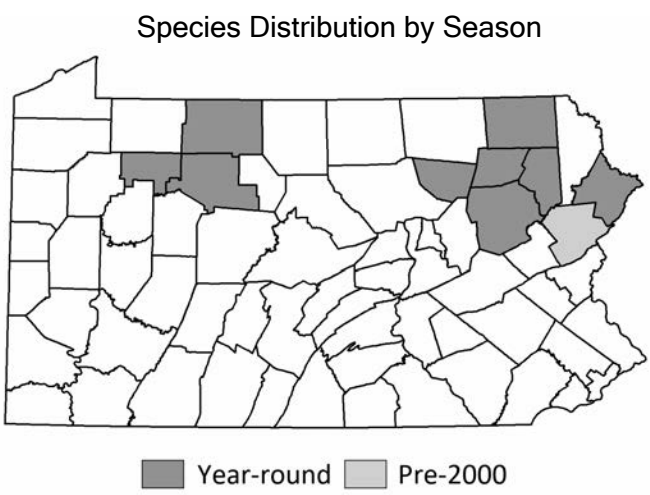
Carterocephalus mandan

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: NatureServere Explorer: Glades, along roadsides, swampy places and streamside grassy openings in cool northern forests; sometimes in bogs or fens.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** # of sites with invasive species controlled with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

NatureServe. YYYY. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/ (accessed June 2025).

PENNSYLVANIA WILDLIFE ACTION PLAN

Appalachian Azure

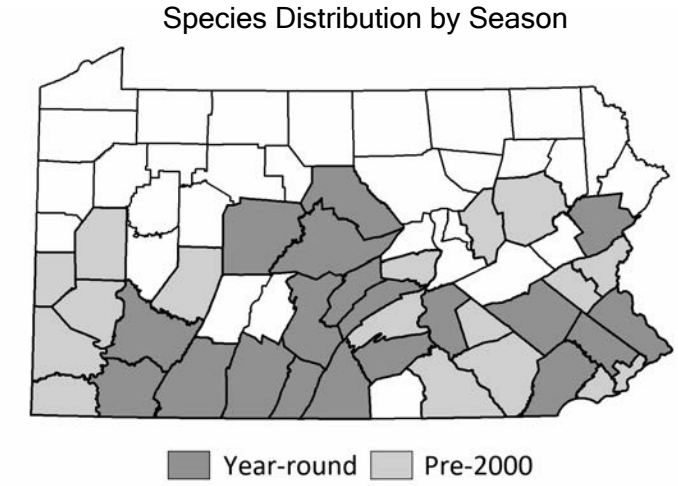
Celastrina neglectamajor

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3?

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Rich, moist woodlands, always in association with hostplant, black cohosh (Cimicifuga racemosa).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Medium

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites with invasive species controlled with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Low

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

Lamprinos, Matthew J., "Impact of whitetail deer overpopulation with hunting on the decline" (2021). English Department: Research for Change - Wicked Problems in Our World. 52.
Available at https://research.library.kutztown.edu/wickedproblems/52 (accessed June 2025).

Natural Lands. What is the Most Dangerous Animal in Pennsylvania? Finding Balance. Available at https://www.natlands.org/news/finding-balance/ (accessed June 2025).

Pennsylvania Department of Conservation and Natural Resources. Conserving Forests and Native Plants through Deer Management. Available at https://www.pa.gov/agencies/dcnr/conservation/wildlife-biodiversity/biodiversity-managament/deer-management.html (accessed June 2025).

Pennsylvania Game Commission. Discover PA Wildlife - White-tailed Deer. Available at https://www.pa.gov/agencies/pgc/wildlife/discover-pa-wildlife/white-tailed-deer.html (accessed June 2025).

Tremblay, J-P., S.D. Cote, T. Rooney, and C. Dussault. 2014. Ecological impacts of deer overabundance on temperate and boreal forests. Article in Annual Review of Ecology Evolution and Systematics. 35:113-47. DOI:10.1146/annurev.ecolsys.35.021103.105725.

PENNSYLVANIA WILDLIFE ACTION PLAN

Dusky Azure

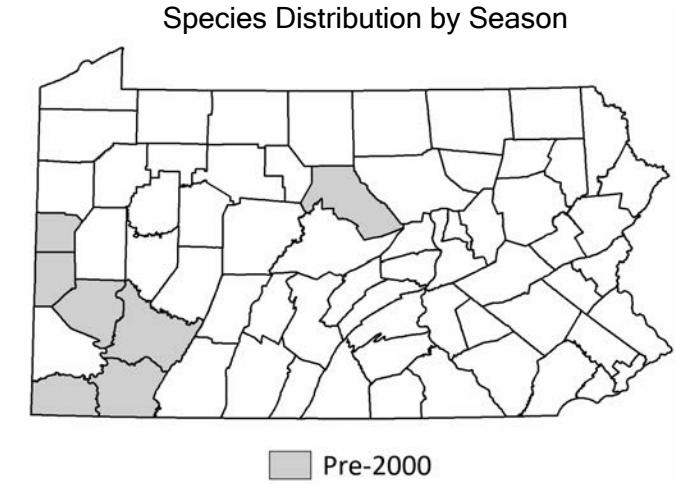
Celastrina nigra

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



H. Salvato



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GU

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SX

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Rich, shaded woodlands, often near streams. Specializes on the host plant goatsbeard (Aruncusdioicus).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: High - Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites and areas with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Pesticide treatments to control spongy moths is a threat.

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

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Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Harris' Checkerspot

Chlosyne harrisii

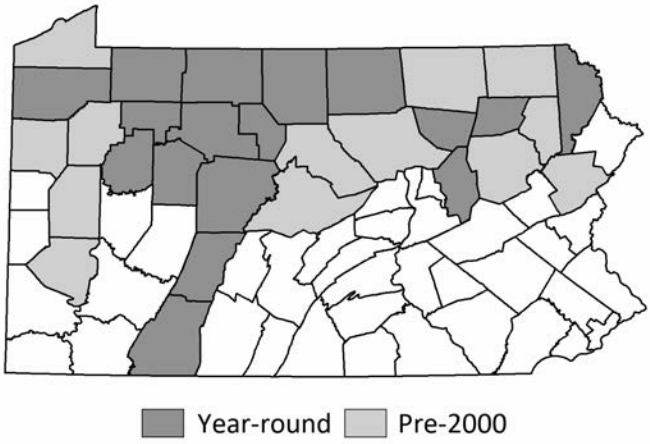
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. McWilliams

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4?

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Moist open areas, such as wet meadows, marsh borders, and bogs. Always in association with its hostplant, flat-topped white aster (Doellingeria umbellata).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pink-edged Sulphur

Colias interior

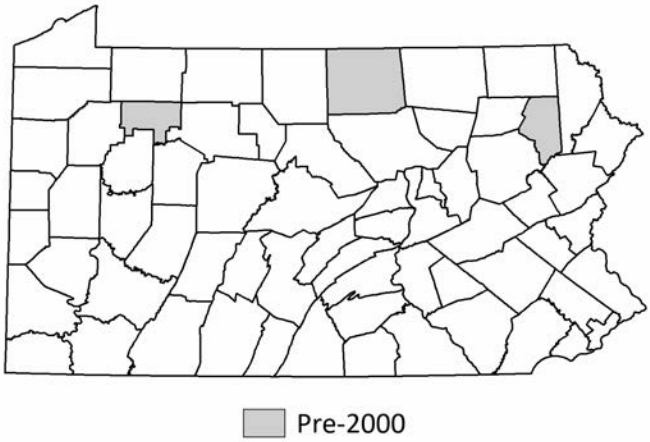
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Northern heath and pine barrens and bogs with abundant blueberry host plant (Vaccinium).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Monarch

Danaus plexippus

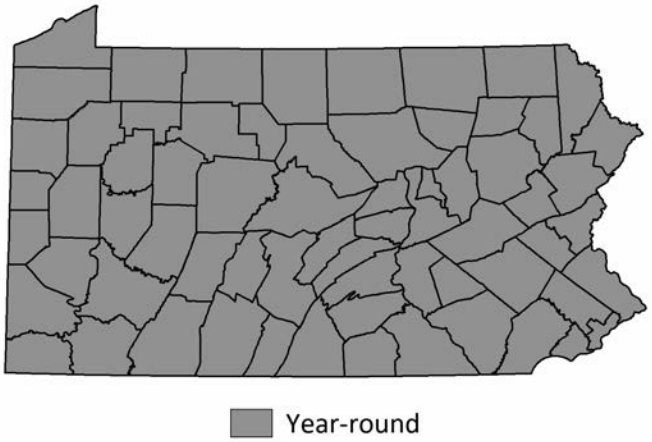
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Proposed Threatened

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Breeding

State Rank (Season): S2S4B

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance:

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Proposed Threatened

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season):

State Rank Year:

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Open fields, meadows, or marshes where milkweeds (Asclepias) grow.

Primary Habitat: Open Upland

Primary Habitat Type: Agriculture: Cropland/Pastures

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Management activities on roadside rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Communicate best practices to minimize impacts from road and utility projects in occupied or suitable habitats for this species.

Objective: Provide educational materials or workshops for land managers.

Action Priority: **Action Urgency:** **Measure:** number of habitat managers engaged with

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Agricultural herbicides and pesticides

Action Category: Manage non-living habitat components

Specific Action: Implement best management practices to reduce agricultural impacts to stream water quality and habitat.

Objective: Implement best management practices to reduce agricultural impacts to stream water quality and habitat.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Invertebrates of stream and riparian wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Early Hairstreak

Erora laeta

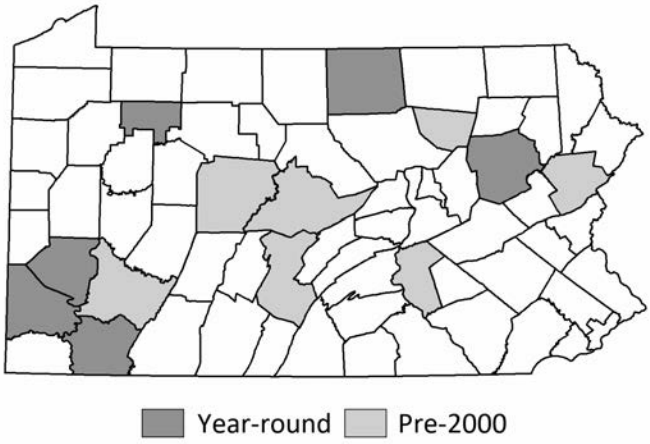
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G2G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1?

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Mixed hardwood forests, most often with many beech trees (Fagus grandifolia), the main host plant for this species.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Loss of the caterpillar food plant, American beech, to introduced pests species and pathogens including beech bark disease and beech leaf disease.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect individual beech trees from Beech Leaf Disease, which is caused by the invasive nematode Litylenchus crenatae mccannii. Currently the most effective treatment is an injection of thiabendazole to the side of root flares of beech trees larger than 10 cm in diameter, and with 50% or less dieback or defoliation. Optimal timing of treatment is June. No viable options are currently available for large scale treatment of beech forests.

Objective: Protect small groves of older beech trees throughout Pennsylvania to retain genetic diversity in the hopes that new treatment options will be developed that can protect beeches in all life stages and allow them to regenerate. Protect large groves of mature beech trees around known early hairstreak populations (100+ trees per population).

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Total number of beech trees treated; percent of Pennsylvania counties with beech tree treatment sites; number of early hairstreak populations with large groves of beech (100+ trees) treated around the population; number of early hairstreak populations surveyed for presence/absence.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Interested Public, Local agencies & municipalities, National Park Service, Non-governmental organizations, Pennsylvania Department of Agriculture, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Game Commission, Private Landowners, U.S. Fish and Wildlife Service, U.S. Forest Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: The American beech is the host plant for a wide variety of insects including beetles, true bugs, wasps, and butterfly and moth caterpillars. Beech nuts are high in protein and fat and are an important food source for many birds and mammals.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

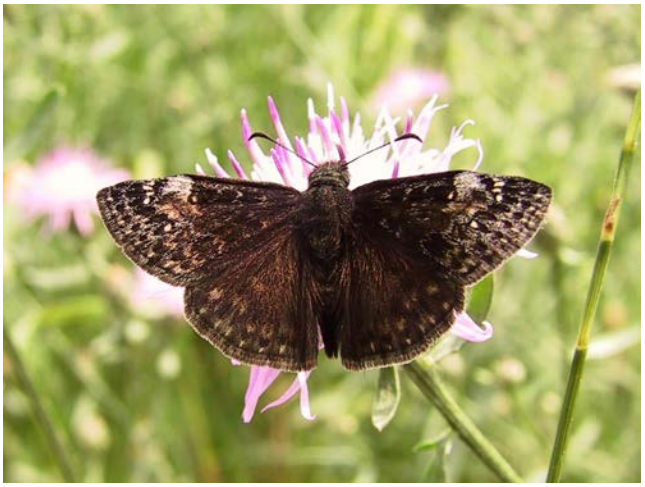
PENNSYLVANIA WILDLIFE ACTION PLAN

Columbine Duskywing

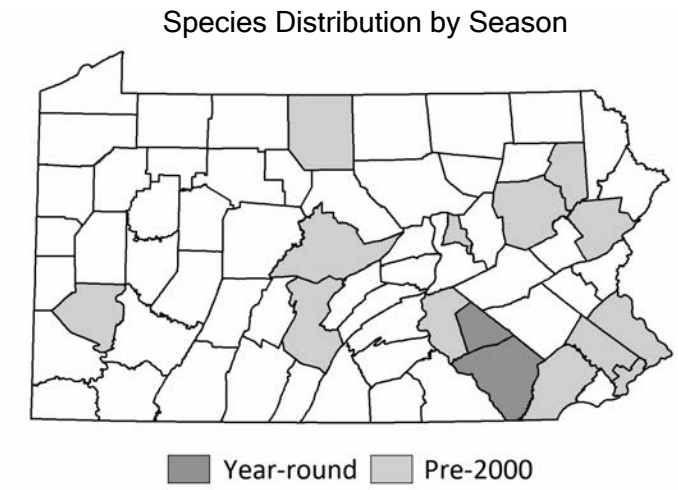
Erynnis lucilius

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Dlugan



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Generally found in rocky wooded areas where wild columbine (Aquilegia canadensis) is found.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Circumneutral Cliff and Talus

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High

Specific Threat: Invasive plants and loss of native plant diversity; use of alternate host plant and hybridization

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** # of sites with invasive species controlled with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Mottled Duskywing

Erynnis martialis

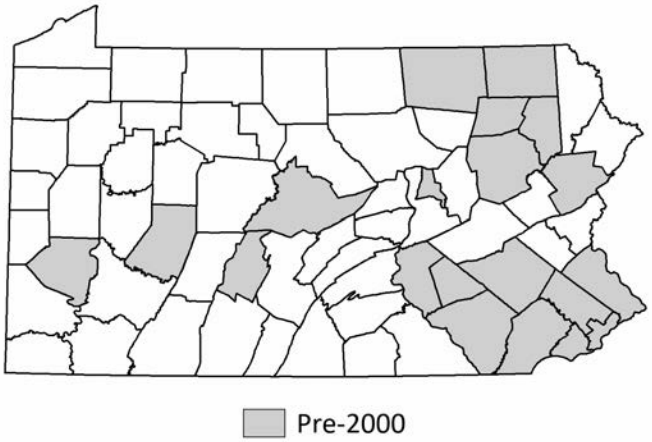
Betsy Leppo, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Landes

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine whether the species is still present in Pennsylvania, and improve habitat to facilitate recolonization or spread of existing populations.

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Dry open woods, barrens, or brushy fields. Host plants include species in the Ceanothus genus, limited to New Jersey tea (Ceanothus americanus) in Pennsylvania.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Serpentine Barren / Woodland

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High

Specific Threat: This skipper depends exclusively on New Jersey Tea (Ceanothus americana) as a larval food source, but this plant is a favorite food of deer. While this formerly abundant plant is not yet categorized as rare in PA, populations are usually very small, and there are very few populations large enough to sustain a population of this skipper.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Install deer fencing around those populations of New Jersey Tea that are known to support specialist herbivores. If data is lacking, assume that larger populations harbor at least one of the SGCN specialists.

Objective: Protect 10 populations of New Jersey Tea with deer exclosures

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number and area of exclosures built; change in area of New Jersey Tea colony

Potential Collaborators: Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulate) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** High - Low

Specific Threat: Fire suppression over the last century may have contributed to the decline of the host plant Ceanothus americana in PA. This insect, however, is probably not able to survive fires, so the habitat must be burned in patches, over time, to allow recolonization from unburned areas.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: When conducting prescribed burns on state lands, identify New Jersey Tea stands within the project area, and incorporate them into the project planning.

Objective: Conduct the burning in patches to ensure that no more than 25% of the New Jersey Tea plants are disturbed by any one round of disturbance, and allow several years for recovery before additional patches of the plant are disturbed.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of burn projects that take New Jersey Tea into consideration. Percent of New Jersey Tea plants burned by each of those projects.

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulata) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High

Specific Threat: This skipper depends exclusively on New Jersey Tea (Ceanothus americana) as a larval food source, but this plant is a favorite food of deer. While this formerly abundant plant is not yet categorized as rare in PA, populations are usually very small, and there are very few populations large enough to sustain a population of this skipper.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys for the six New Jersey Tea specialist SGCN should be conducted where medium to large patches of New Jersey Tea are found. Presence of one of these species is evidence that the patch may be large and stable enough to support some of the other species.	Universities & research institutions

No known monitoring programs.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Persius Duskywing

Erynnis persius

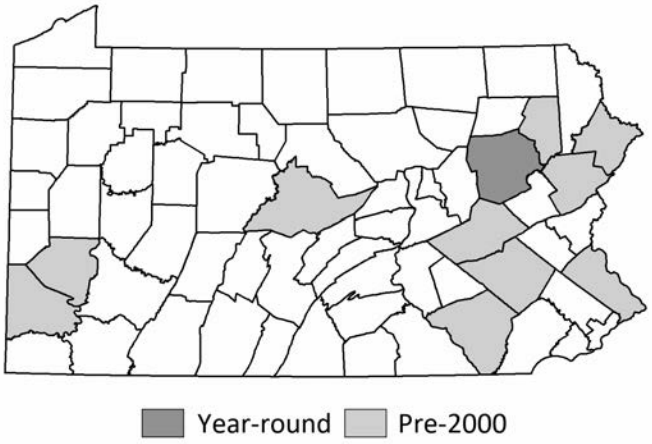
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Medium

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Encourage communication and share information between wildlife biologists, landowners / land managers, and utility companies

Objective: Facilitate communication between landowner/ land manager and utility companies to coordinate and adapt activities to optimize habitat for SGCN species while protecting utility resources. Share information on best practices for habitat management on right-of-ways to benefit SGCN insects and other wildlife.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Medium

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open habitats composed of native grasses and forbs, and control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

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Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Olympia Marble

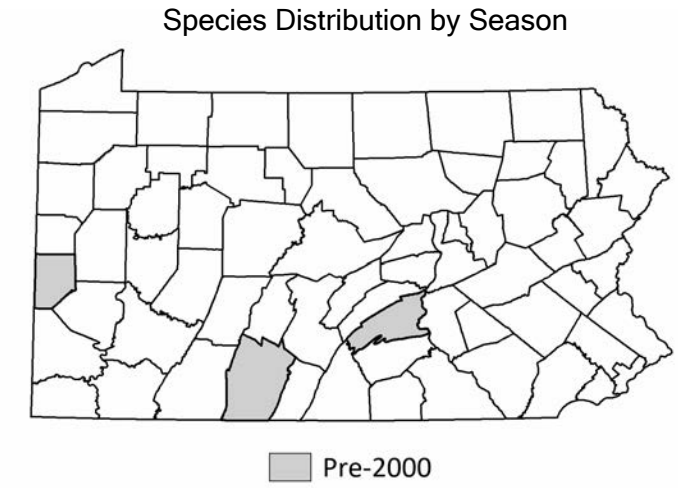
Euchloe olympia

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Mossman



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Dry, open areas such as ridgetops, barrens and dry meadows. Rock cresses (Arabis) are hostplant.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: High - Medium

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites and areas with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Medium

Specific Threat: Pesticide treatments to control spongy moths is a threat.

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Baltimore Checkerspot

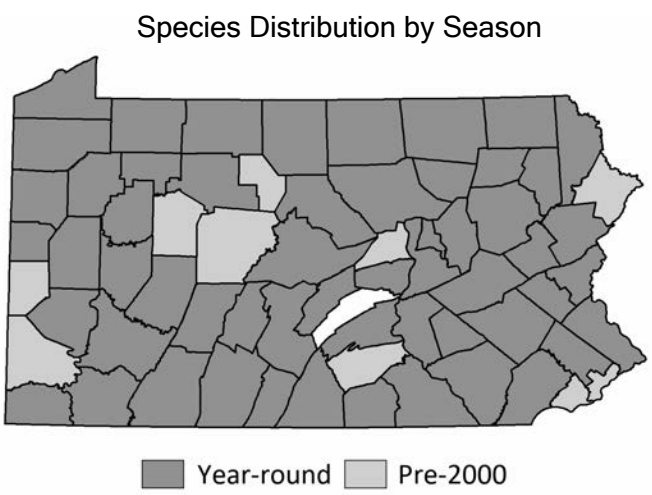
Euphydryas phaeton

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Either wet meadows and marshes or dry fields, depending on whether it is primarily feeding on. In Pennsylvania, eggs and early instars of the Baltimore Checkerspot are primarily associated with wet meadow habitats with turtlehead (Chelone glabra) as the host plant.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors and buffers and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife utilizing wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows; Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; implementation of restoration plans; best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium - Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation at low levels; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

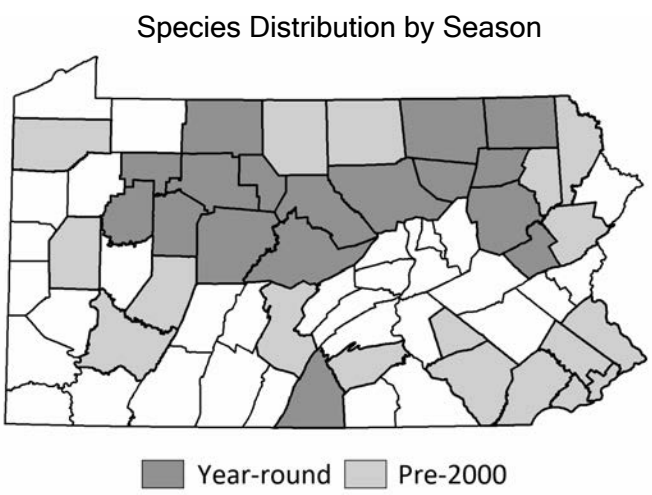
Two-spotted Skipper

Euphyes bimacula

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Wet acid habitats, such as bogs, acid marshes, and meadows, with sedges (Carex).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:**

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Black Dash

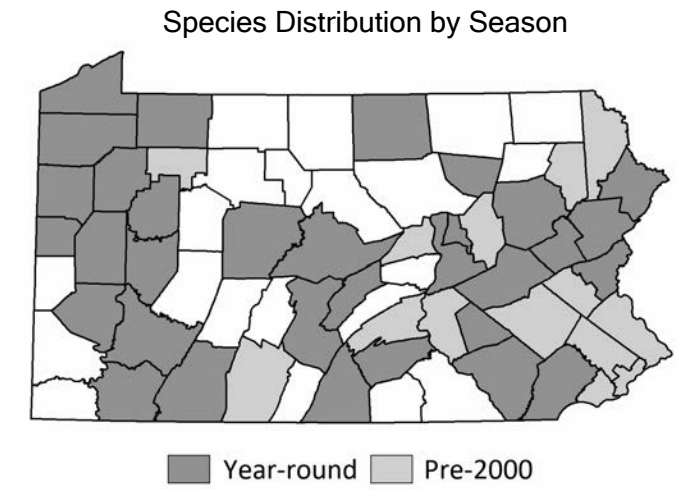
Euphyes conspicua

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Leppo



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Open wetlands, such as wet meadows, freshwater marshes, or bogs. Host plants are sedges (Carex).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Low

Specific Threat: Agricultural run-off such as manure, chemical fertilizers, sediments, pesticides, etc.

Action Category: Manage non-living habitat components

Specific Action: Implement best management practices to reduce agricultural impacts to stream water quality and habitat.

Objective: Improve stream and riparian wetland water quality and habitats.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Invertebrates of stream and riparian wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Performance metric: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** # of sites with invasive species controlled with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

Breed, Greg, Sharon Stichter, and Elizabeth Crone. 2013. Climate-driven changes in northeastern U.S. butterfly communities. Nature Climate Change, Nature 3(2):142-145.

PENNSYLVANIA WILDLIFE ACTION PLAN

Dion Skipper

Euphyes dion

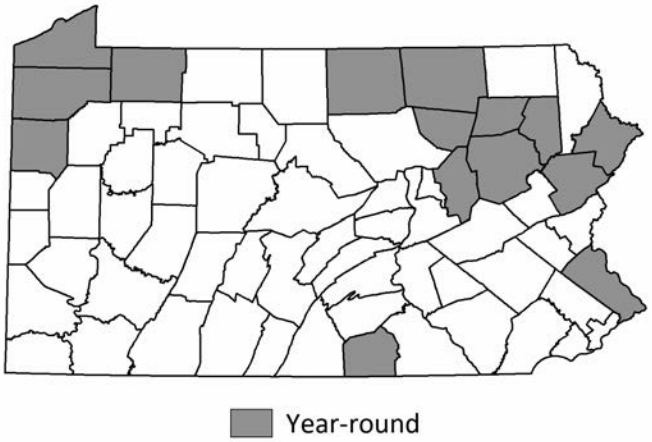
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Open, calcareous-to-neutral wetlands with sedges (Carex)..

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** # of sites with invasive species controlled with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action:

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Leonard's Skipper

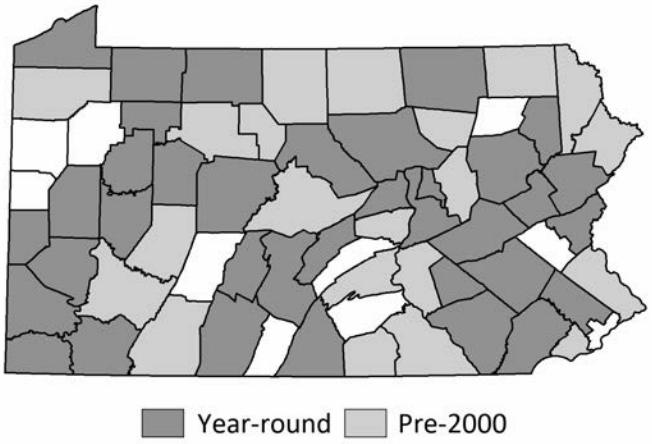
Hesperia leonardus

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A variety of habitats dominated by native grasses (e.g. Agrostis, Panicum, Andropogon), such as open woodlands and natural or anthropogenic grasslands.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open habitats composed of native grasses and forbs, and control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Cobweb Skipper

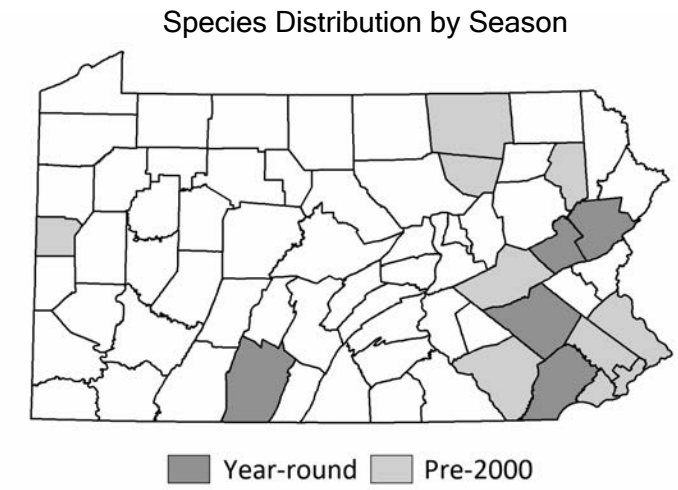
Hesperia metea

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Primarily dry, open habitats such as barrens, oak savannas, or rocky glades, in association with hostplants big bluestem and little bluestem (Andropogon gerardii and Schizachyrium scoparium).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** # of sites with invasive species controlled with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open habitats composed of native grasses and forbs, and control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

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Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

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PENNSYLVANIA WILDLIFE ACTION PLAN

Indian Skipper

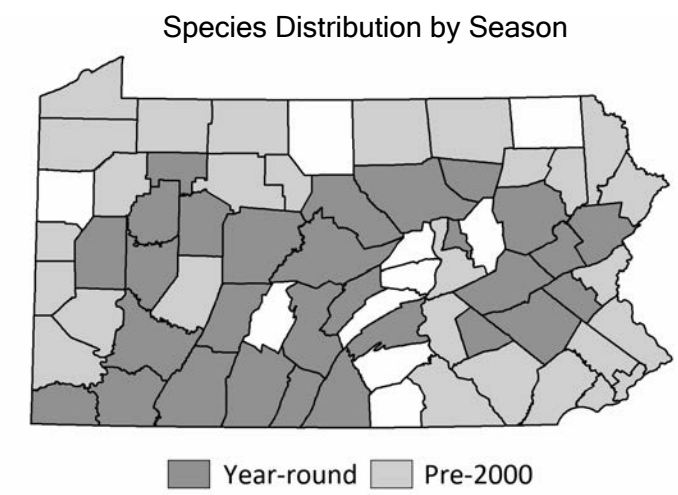
Hesperia sassacus

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. McWilliams



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Very High

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Grassy openings in forests. Hostplants are various grasses (e.g. Festuca, Digitaria, and Danthonia).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Eyed Brown

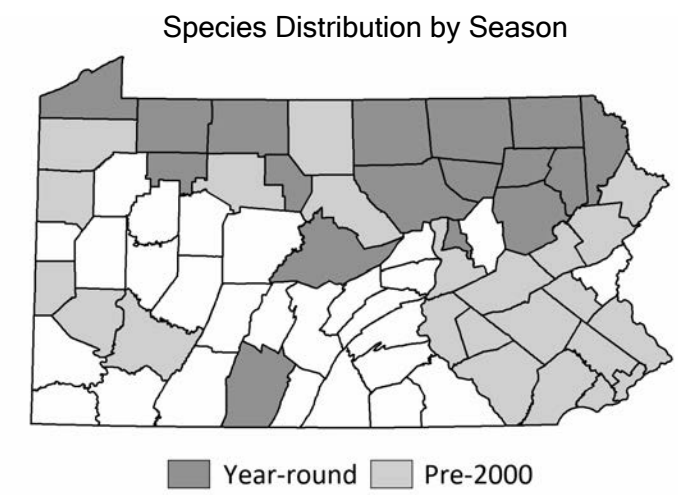
Lethe eurydice

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: A wide variety of sedge (Carex) wetlands.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Freshwater Marsh

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conservation planning

Specific Action: Create an invasive species management plan

Objective: Manage invasive species at a low level at local sites

Action Priority: **Action Urgency:** Initiate within 5 years **Measure:** Number of plans developed

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

Name:

Lead(s) :

Link:

Description:

Name: None known

Lead(s) :

Link: N/A

Description:

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Bog Copper

Lycaena epixanthe

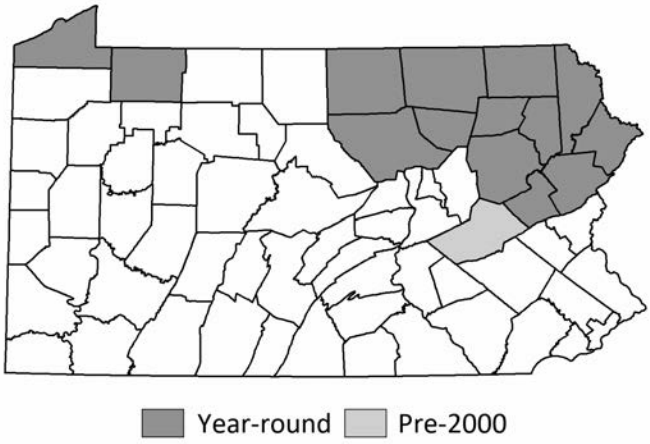
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Koval

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Wetlands, most often acid bogs with cranberries (Vaccinium).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Environmental Protection Agency

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement.

Objective: Identify and prioritize bogs for protections. Pursue protection options at high priority sites.

Action Priority: 3-Medium **Action Urgency:** **Measure:** number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts

Locations: Physiographic Section: Northwestern Glaciated Plateau, Deep Valleys, Glaciated High Plateau, Glaciated Low Plateau, Anthracite Valley, Glaciated Pocono Plateau

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris) Darlington's Harp Ground Beetle (Agonum darlingtoni)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Bronze Copper

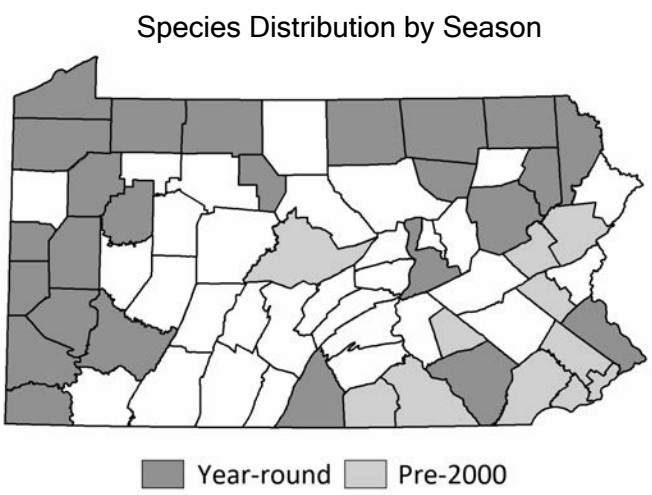
Lycaena hyllus

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. McWilliams



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Low wet meadows and marshes, usually along waterways. Host plants are a variety of dock (Rumex) species.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Freshwater Marsh

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** # of sites with invasive species controlled with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

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Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

West Virginia White

Pieris virginiensis

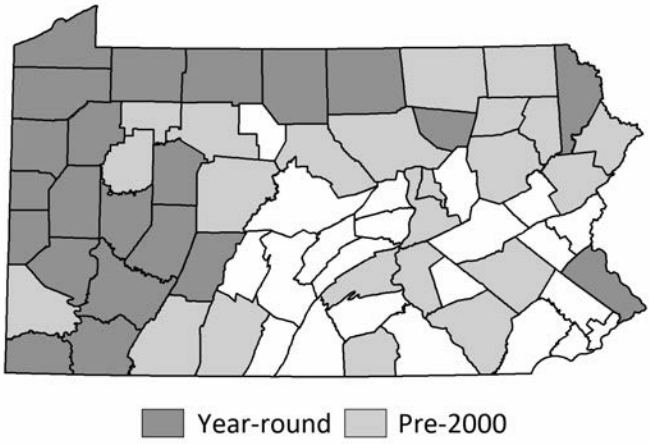
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Yeany

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Rich, moist woodlands and forests, where toothworts (Dentaria), or occasionally rock cress (Arabis) are present.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium

Specific Threat: Roads fragment habitats, create corridors for invasive species, disrupt movement corridors, alter site microhabitats, and cause adult mortality.

Action Category: Outreach, communication and distribution

Specific Action: Conduct environmental review and provide conservation measures to minimize impacts from road and utility projects in occupied or suitable habitats for this species.

Objective: Avoid development of new roads, widening of existing roads, and removal of canopy over dirt and paved roads in West Virginia White habitats; control invasive species, especially garlic mustard (Alliaria petiolata), along roadways

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of consultations that review and provide recommendations to protect West Virginia White habitat.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Other state agency, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Wildlife of contiguous, unfragmented forests

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Medium

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Medium

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Low

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

Davis, S.L. and D. Cipollini. 2014. How Environmental Conditions and Changing Landscapes Influence the Survival and Reproduction of a Rare Butterfly, Pieris virginiensis (Pieridae).

Finnell, A.S. and C. A. Lehn. 2007. West Virginia White Butterfly Conservation Plan 1.0. Biodiversity Alliance, Cleveland, OH

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Available at https://research.library.kutztown.edu/wickedproblems/52 (accessed June 2025).

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PENNSYLVANIA WILDLIFE ACTION PLAN

Mulberry Wing

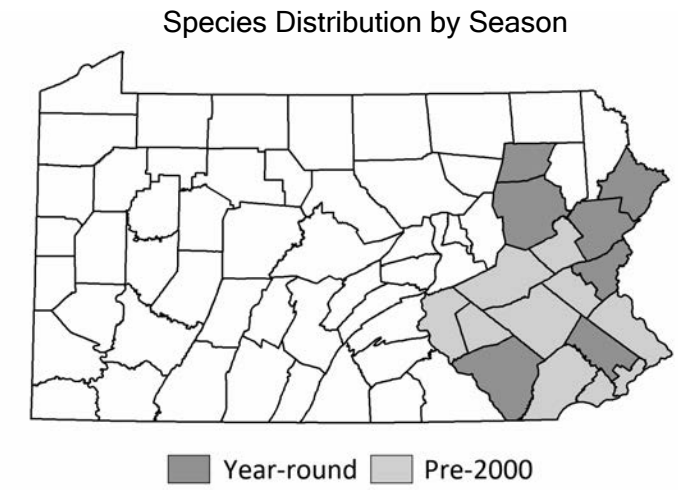
Poanes massasoit

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Open or shrubby wetlands, with sedges (Carex).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Low

Specific Threat: Agricultural run-off such as manure, chemical fertilizers, sediments, pesticides, etc.

Action Category: Manage non-living habitat components

Specific Action: Implement best management practices to reduce agricultural impacts to stream water quality and habitat.

Objective: Improve stream and riparian wetland water quality and habitats.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Water chemistry, habitat, and IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Invertebrates of stream and riparian wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Broad-winged Skipper

Poanes viator viator

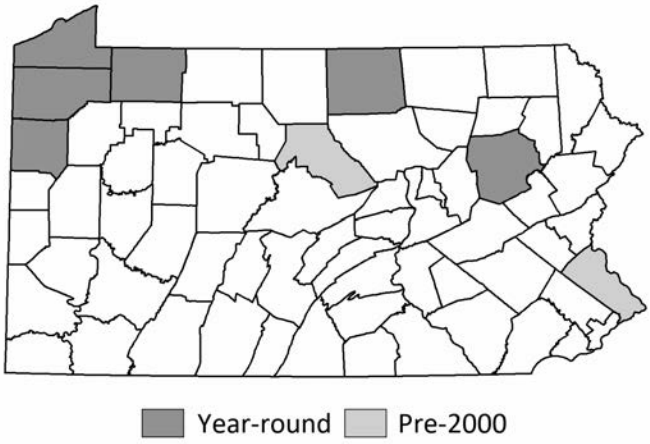
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5T4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Sedge meadows, particularly with hairy sedge (Carex lacustris).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium - Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of herbaceous wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Long Dash

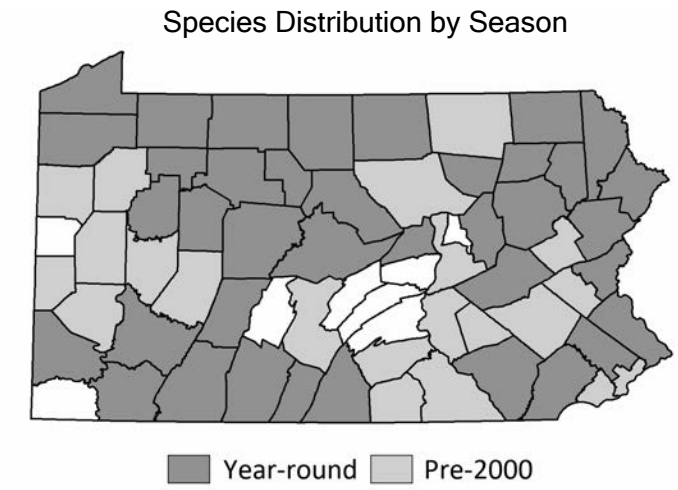
Polites mystic

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open grassy habitats, both wet and dry. Caterpillars feed on grasses, particularly bluegrass (Poa).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Green Comma

Polygonia faunus

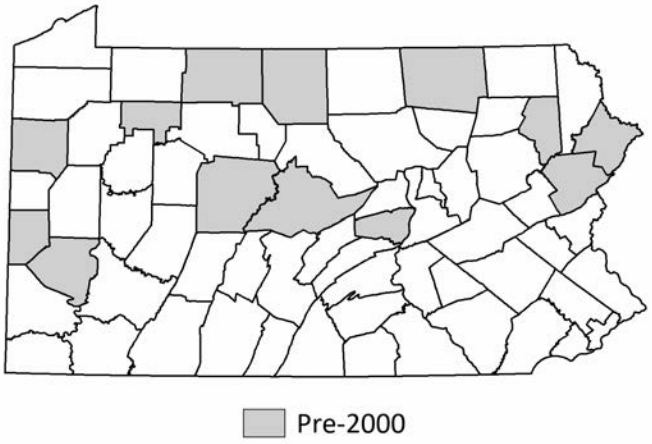
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Northern conifer and hardwood forests. Feeds primarily on willows (Salix), birches (Betula), and alders (Alnus).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Appalachian (Hemlock)-Northern Hardwood Forest

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Appalachian Grizzled Skipper

Pyrgus wyandot

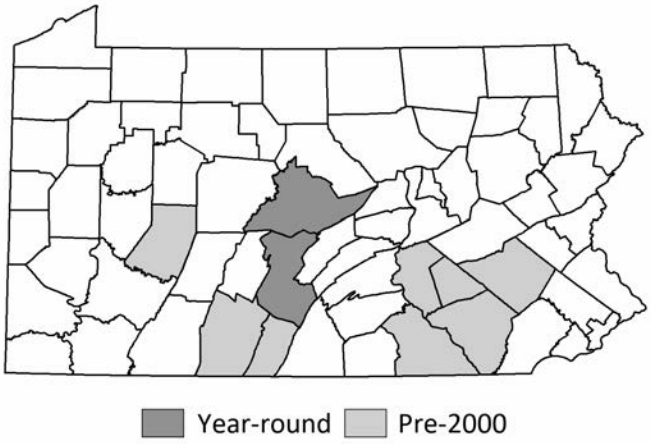
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G1G2Q

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Open rocky outcrops, particularly shale barrens. Host plant is dwarf cinquefoil (Potentilla canadensis).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** High - Medium

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Encourage communication and share information between wildlife biologists, landowners / land managers, and utility companies

Objective: Facilitate communication between landowner/ land manager and utility companies to coordinate and adapt activities to optimize habitat for SGCN species while protecting utility resources. Share information on best practices for habitat management on right-of-ways to benefit SGCN insects and other wildlife.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** High - Medium

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc. Ha ha!

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium

Action Urgency: Initiate immediately

Measure: Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites with invasive species controlled with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** High - Low

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open habitats composed of native grasses and forbs, and control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Acadian Hairstreak

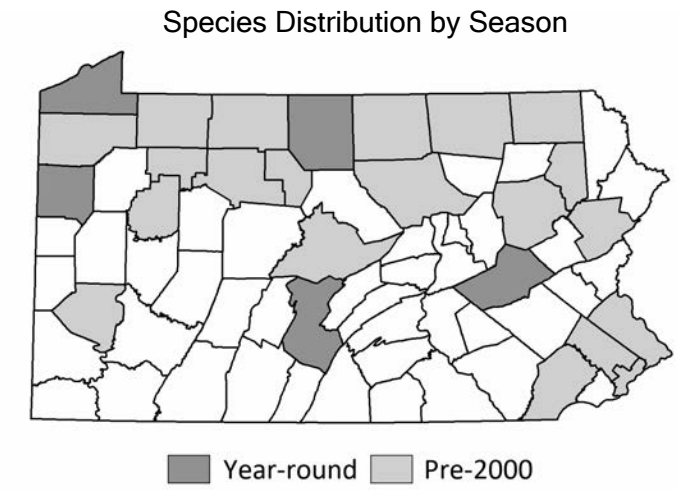
Satyrium acadica

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Shrubby wetlands, occasionally sandy or rocky upland habitats, always with host plant, willows (Salix).

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Geological Survey

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoWetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium - Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Edwards' Hairstreak

Satyrium edwardsii

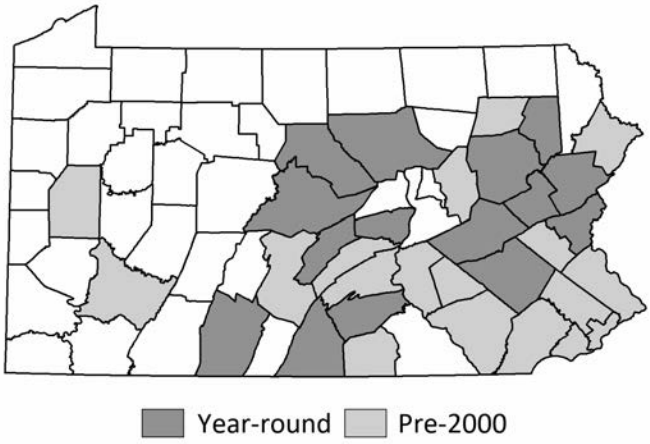
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Dry, open woodlands with poor soils and small oaks, particularly scrub oak (Quercus ilicifolia).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Oak Hairstreak

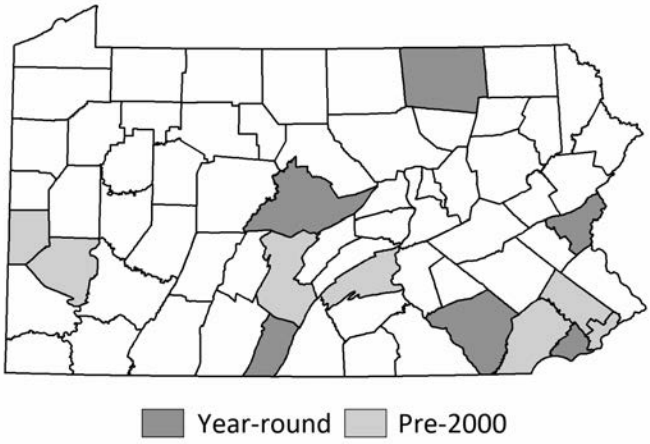
Satyrium favonius

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: oak forest & woodland

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Unknown

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Golden-banded Skipper

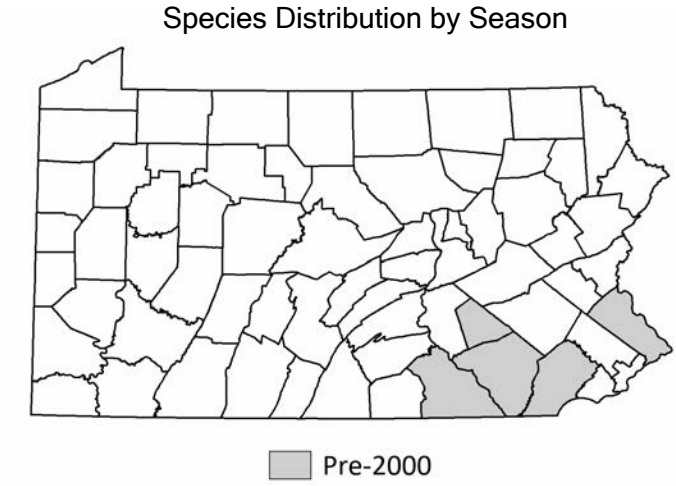
Telegonus cellus

Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Steep, moist woodlands and forests, Thicket bean (Phaseolus polystachios) is the host plant.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High - Medium

Specific Threat: White-tailed deer browse on caterpillar food plants (for species known to feed as adults, add 'and adult nectar resources').

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

Lamprinos, Matthew J., "Impact of whitetail deer overpopulation with hunting on the decline" (2021). English Department: Research for Change - Wicked Problems in Our World. 52.
Available at https://research.library.kutztown.edu/wickedproblems/52 (accessed June 2025).

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Tremblay, J-P., S.D. Cote, T. Rooney, and C. Dussault. 2014. Ecological impacts of deer overabundance on temperate and boreal forests. Article in Annual Review of Ecology Evolution and Systematics. 35:113-47. DOI:10.1146/annurev.ecolsys.35.021103.105725.

PENNSYLVANIA WILDLIFE ACTION PLAN

Silvery Blue

Glaucopsyche lygdamus lygdamus

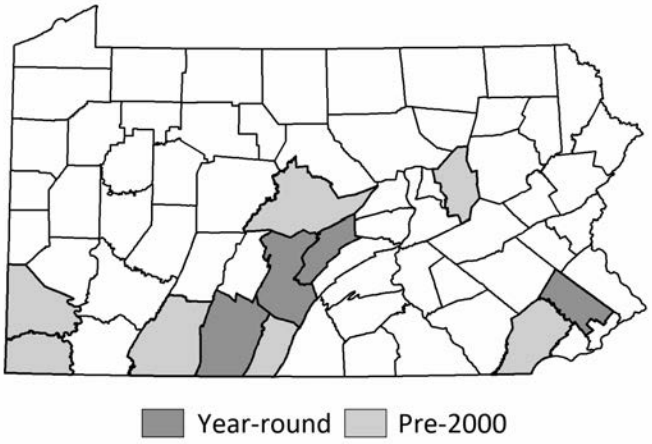
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5T3T4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: sparsely vegetated barrens and roadsides with the host plant Carolina vetch (Vicia caroliniana)

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Medium

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Medium

Specific Threat: Spongy moth pesticide spray; invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High - Low

Specific Threat: Loss of genetic distinctiveness due to hybridization with newly arrived subspecies

Action Category: Basic research and status monitoring

Specific Action: Document the genetic structure and diversity of populations of the silvery blue (Glaucopsyche lygdamus lygdamus) and the northern silvery blue (Glaucopsyche lygdamus couperi) across their ranges in Pennsylvania

Objective: Document the unique genetic diversity of silvery blue (Glaucopsyche lygdamus lygdamus) and Northern Silvery Blue (Glaucopsyche lygdamus couperi) populations in Pennsylvania and adjacent states, before they make contact as the range of the Northern Silvery Blue expands.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of silvery blue and northern silvery blue populations sampled and with completed genetic analysis

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High - Medium

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

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Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

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Tremblay, J-P., S.D. Cote, T. Rooney, and C. Dussault. 2014. Ecological impacts of deer overabundance on temperate and boreal forests. Article in Annual Review of Ecology Evolution and Systematics. 35:113-47. DOI:10.1146/annurev.ecolsys.35.021103.105725.

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Regal Fritillary

Argynnis idalia

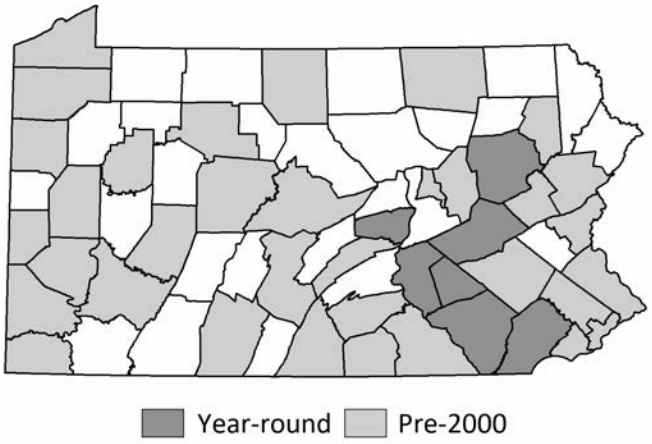
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3?T1

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN:

Federal Listing Status: Proposed Endangered

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Large expanses of grasslands and moist meadows with an abundance of: Violets, which are the caterpillar host plants, especially arrow-leaved violet (Viola sagittata); Nectar sources that bloom in mid-summer, especially common milkweed (Asclepias syriaca) and butterfly milkweed (Asclepias tuberosa), and native thistles like pasture thistle (Cirsium pumilum) and field thistle (Cirsium discolor); and native warm season grasses, particularly little bluestem (Schizachyrium scoparium) and broomsedge (Andropogon virginicus).

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: High

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Spongy moth pesticide spray; invasive pests attacking critical food resources

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Southern Cloudywing

Thorybes bathyllus

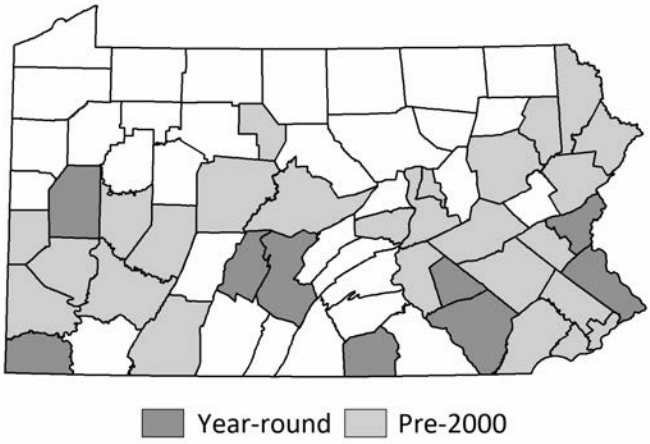
Betsy Leppo

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Yet Assessed

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: open scrub areas, dry woodlands, and powerline clearings. The host plants are various legumes.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of early successional old field and shrubland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Southern Variable Dart Moth

Xestia elimata

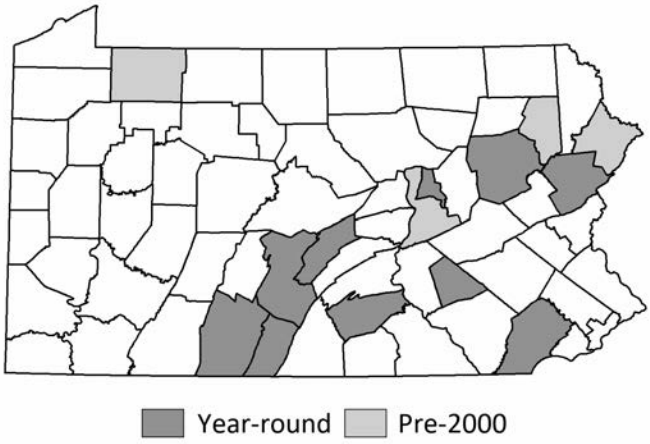
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Noble

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Barrens and pine woodlands, known to feed on a variety of conifers.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Broad Sallow Moth

Xylotype capax

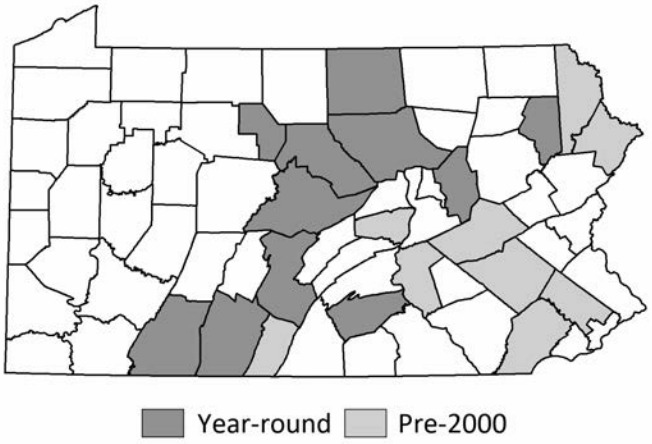
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Bier

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Acid soil pine barrens, swamps, bogs, and dry oak woodlands. Host plants are most often highbush blueberry (Vaccinium coryumbosum) and wild cherry (Prunus).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Pesticide treatments to control spongy moths is a threat.

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Black-eyed Zale Moth

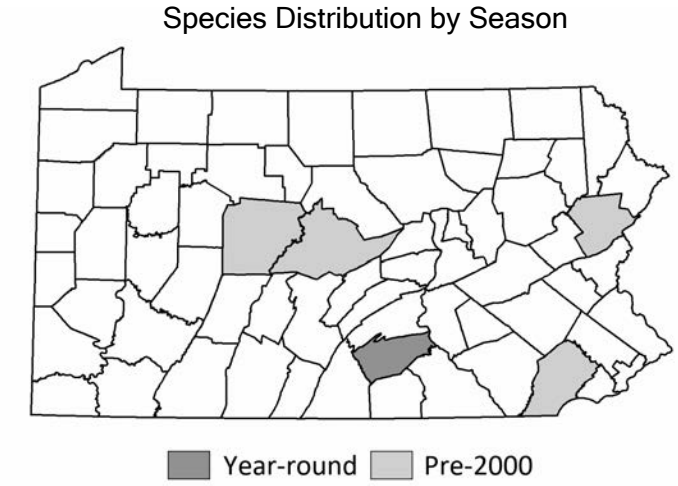
Zale curema

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Kohl



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Found in a variety of habitats, primarily associated with pitch pine (Pinus rigida).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High - Medium

Specific Threat: Loss of host plant, pitch pine (Pinus rigida) due to southern pine beetle outbreaks.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Manage aging and overly dense stands of pitch pine to make them less vulnerable to southern pine beetle outbreaks.

Objective: Stand density is a critical factor associated with the start of an outbreak and how quickly it spreads. The USDA Forest Service recommends that pine stands with a basal area greater than 120 ft2 per acre should be thinned to below 80 ft2 per acre.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of pitch pine dominated woodland and forest stands managed for the recommended basal area density.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that occupy pitch pine woodlands and forests

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pine Barrens Zale Moth

Zale lunifera

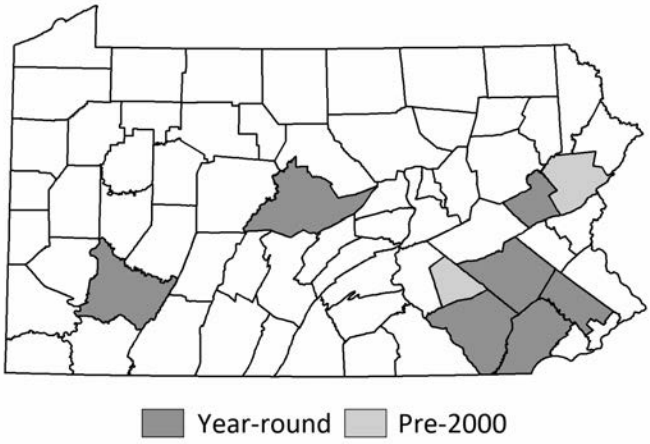
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Frannysopranny

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Dry oak woodlands and barrens, specializes on scrub oak (Quercus ilicifolia). Note: 'Zale sp. 1' of authors.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Oblique Zale Moth

Zale obliqua

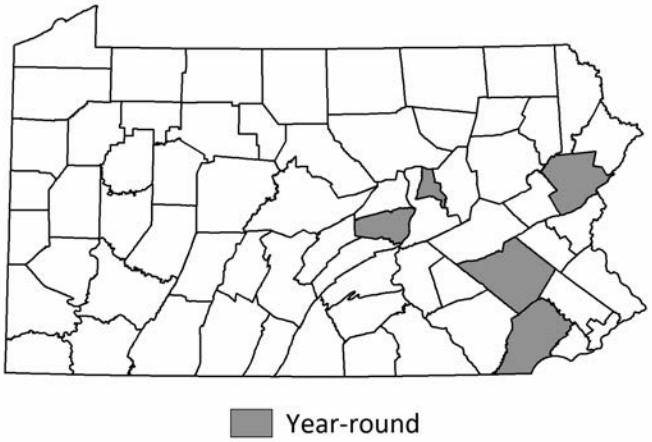
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Niznik

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Barrens and pine woodlands, known to feed on a variety of pines.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Gray-banded Zale Moth

Zale squamularis

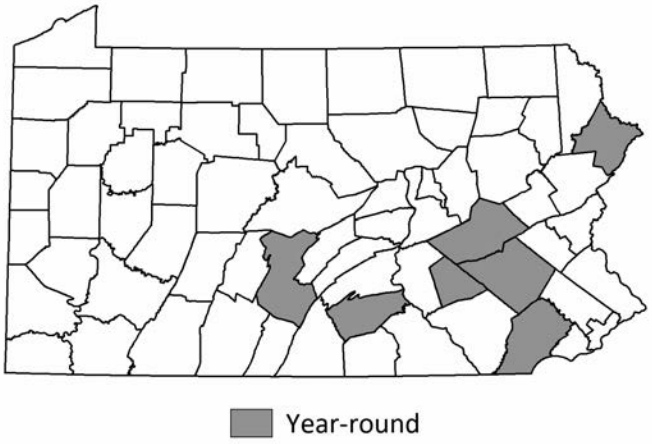
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



jayrand

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Found in a variety of habitats, primarily associated with pitch pine (Pinus rigida).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Gray Spring Zale Moth

Zale submediana

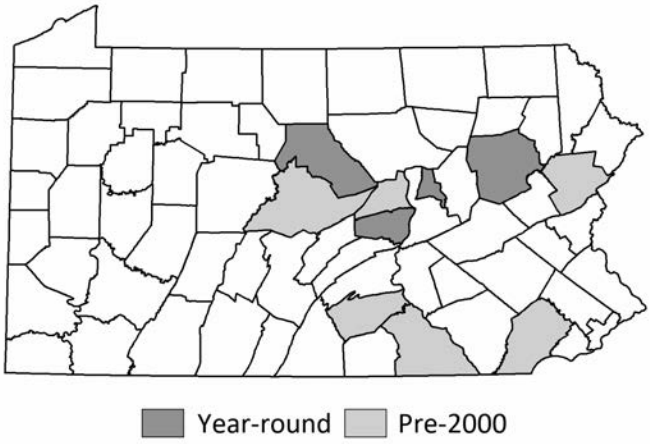
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



T. Murray

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Dry, sandy conifer forests. Host plants are a variety of pines.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Central Appalachian Dry Oak-Pine Forest

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pine Barrens Zanclognatha Moth

Zanclognatha martha

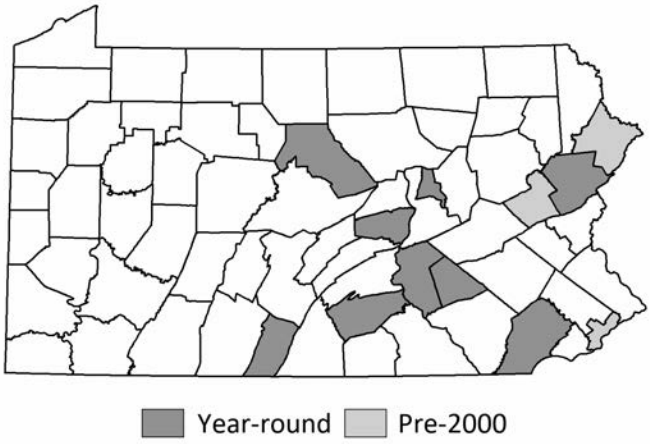
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Akresh

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Mostly found in pitch pine barrens, likely feeds on dropped needles from pitch pine (Pinus rigida).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Doll's Merolonche Moth

Acronicta dolli

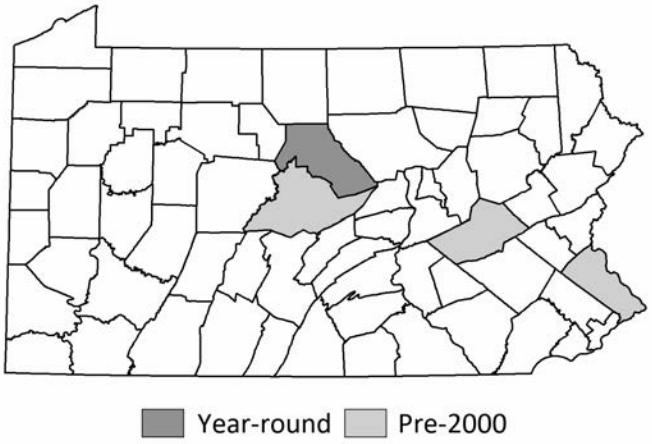
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: Found primarily in acidic oak-heath forests and wetlands. Host plants are likely a variety of scrubby oaks (e.g., Quercus ilicifolia) and blueberries (Vaccinium). Seems to prefer more open sections of barrens habitats where the trees are stunted and scrub oak and low heaths are abundant.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Habitat Comments: The egg, larva, and pupae of this species are very vulnerable to fire mortality. Adults in flight would have a chance to escape. This species has a single generation annually with adults in flight in April (peak flight in mid to late April).

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** High - Medium

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: pollinators of barrens and woodland habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Spiny Oakworm Moth

Anisota stigma

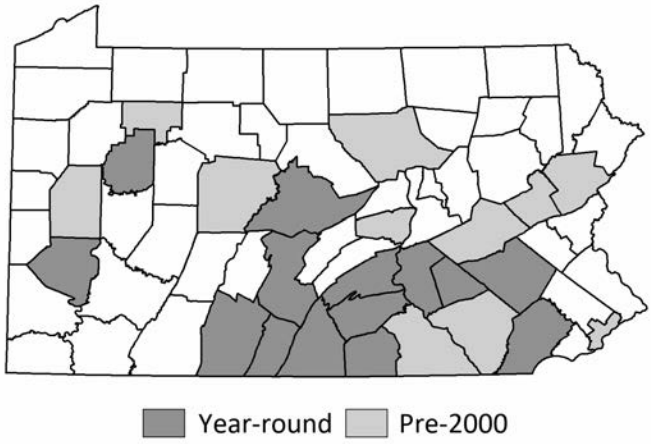
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Dry oak woodlands and barrens. Host plants are oaks (Quercus), but also known to feed on hazelnut (Corylus), and basswood (Tilia).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Burgess's Cutworm Moth

Apamea burgessi

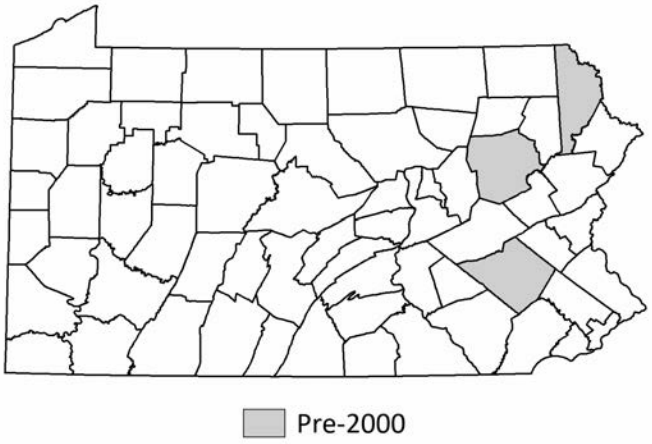
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Unknown, but likely the roots of grasses (Poaceae) like other members of the genus.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Not In Timeframe

Specific Threat: Loss of barrens and grassland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open habitats composed of native grasses and forbs, and control invasive species.

Objective: Mowing and prescribed fire are necessary to keep grasslands, meadows and barrens open. These activities disrupt wildlife the least when conducted between late fall and early spring. Manage habitats on a rotational basis, and disturb less than a quarter of core open habitats in a year (provides refuge in unmanaged habitat). Permanent fire refugia are important for Lepidoptera. Where SGCN insects occur, document key resources (host and nectar plants) and adjust management to encourage them. Allow shrubs and small trees to feather edges of forest openings and keep shrub and tree 'islands' in large openings to provide shelter. Where trees are incompatible with infrastructure, create diverse vegetation structure using feathered edges and encouraging patches of native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc. Create habitat using turf to meadow projects. See the best practices references for more information.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Acreage of woody vegetation and invasive species controlled with best practices implemented to reduce potential negative impacts to native vegetation and optimize habitat conditions for SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

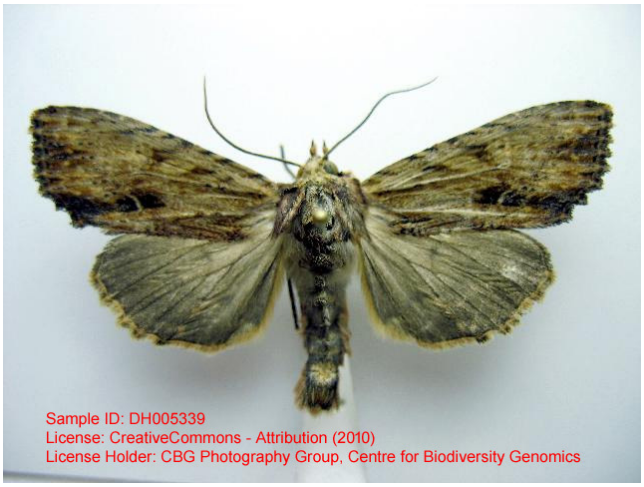
PENNSYLVANIA WILDLIFE ACTION PLAN

A noctuid moth

Apamea cristata

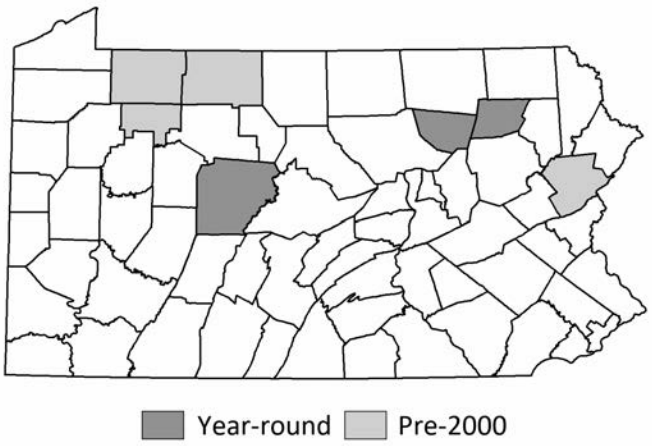
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Manz

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Members of the Apamea genus typically feed on grasses or sedges.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A noctuid moth

Agnorisma bugrai

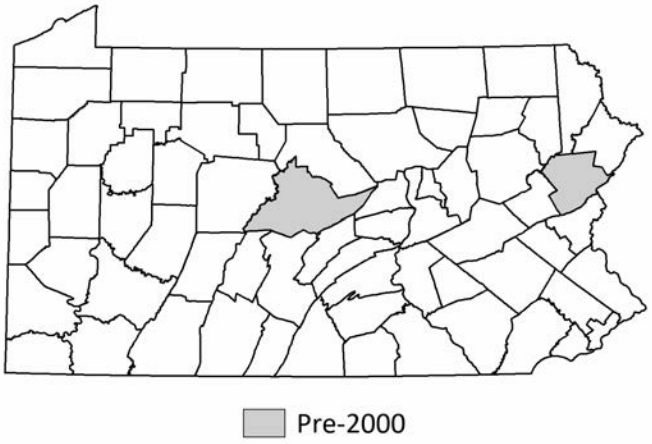
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Macaulay

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Associated with northern, cold, and high elevation habitats.

Primary Habitat: Forested Upland

Primary Habitat Type: High Elevation Forests

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: Low

Specific Threat: Climate change may have reduced suitability of habitats for this species that is associated with cooler climates and higher elevation forests in Pennsylvania.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority:

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A noctuid moth

Apamea alia

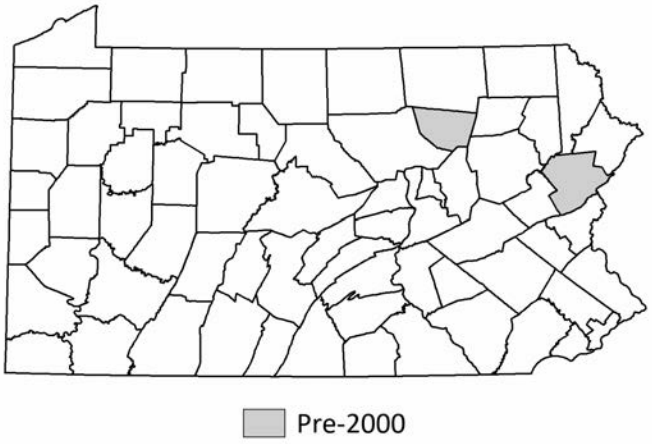
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Moist forest, savanna and grassland habitats.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: Medium - Low

Specific Threat: Loss of suitable habitat in Pennsylvania due to climate change.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A noctuid moth

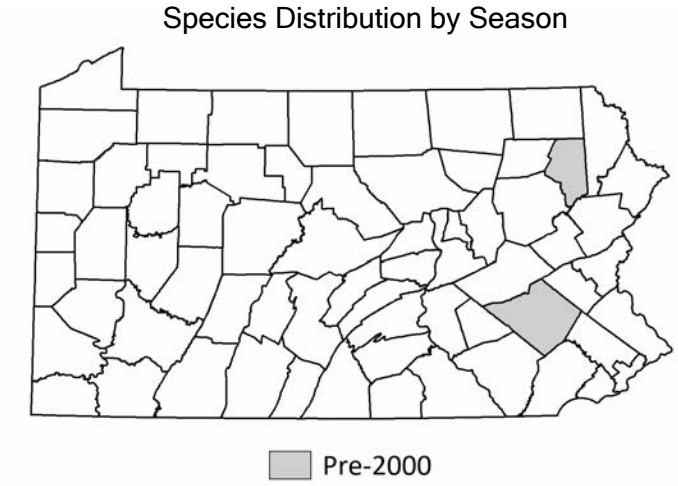
Apamea inordinata

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GU

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: NatureServe places this species in the Sand Prairie, Savanna, And Barrens Openings Moths group.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Pennsylvania is at the southern edge of this species' range; this species is known from one high elevation ridgetop barrens habitat in Pennsylvania.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A noctuid moth

Apamea relicina

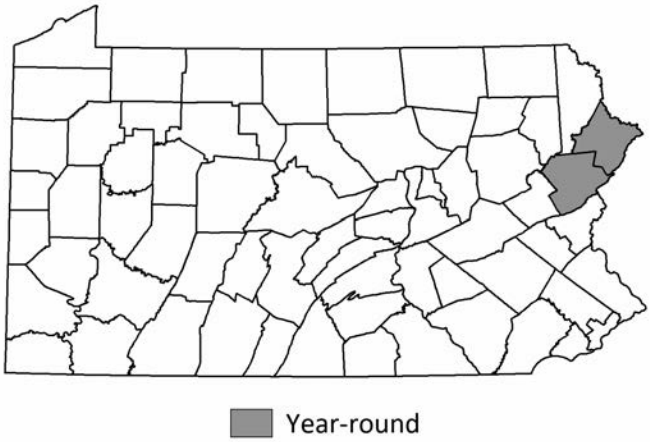
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Mossman

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: barrens

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A noctuid moth

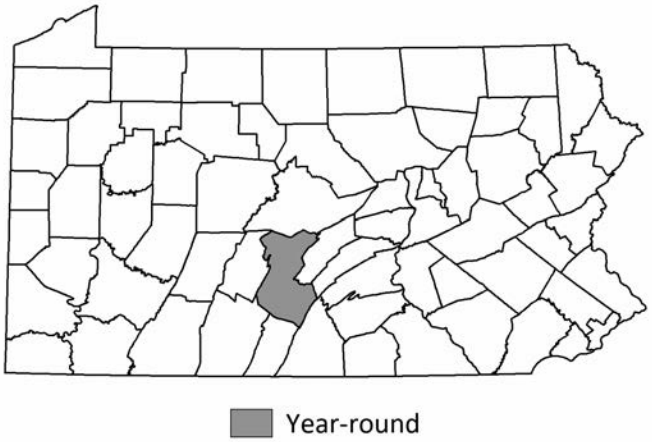
Apamea wikeri

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: mesic upland forests, floodplains, and shaded stream banks. The hostplant is American beakgrain (Diarrhena obovata).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: South-Central Interior Mesophytic Forest

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: High

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Logging and Wood Harvesting **Threat Impact:** High

Specific Threat: Impacts of logging on caterpillar food plant

Action Category: Outreach, communication and distribution

Specific Action: Work with interested landowners and land managers to monitor and protect populations of American Beak Grass (Diarrhena americana)

Objective: Work with interested landowners and land managers to identify where American Beak Grass grows on their property and to monitor those populations. Share information on habitat needs of the plant and its association with a rare moth. Provide voluntary best practices that can be implemented during habitat management activities such as timber harvests to protect the plant from disturbance. Share simple monitoring protocols to engage land owners and land managers in tracking the persistence of their populations.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of land owners / land managers contacted; number of American beak grass populations monitored

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: Ridge and Valley. Physiographic Section: Appalachian Mountain

Other species likely to benefit from this action: American beakgrain (Diarrhena americana), which is a rare plant found in rich woods in Pennsylvania

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A noctuid moth

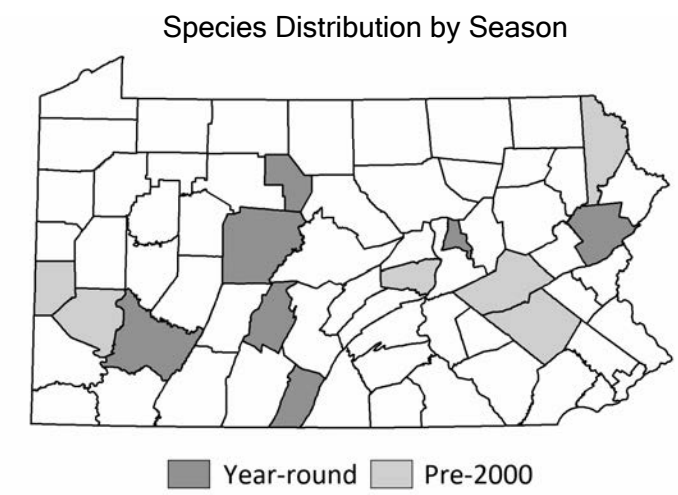
Apamea cariosa

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forest and woodlands with grassy glades, also barrens habitats.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of forest and woodland glades and barrens habitats due to conversion, succession, and fragmentation. There appears to be some range-wide decline.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain forest and woodland habitats with scattered small glades and/or openings along trail sides that support native woodland grasses, and control invasive species.

Objective: Mow or handcut woody plants in the dormant season to maintain small glades and trailside openings.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Acreage of woody vegetation and invasive species controlled with best practices implemented to reduce potential negative impacts to native vegetation and optimize habitat conditions for SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of woodland glades

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A noctuid moth

Feltia manifesta

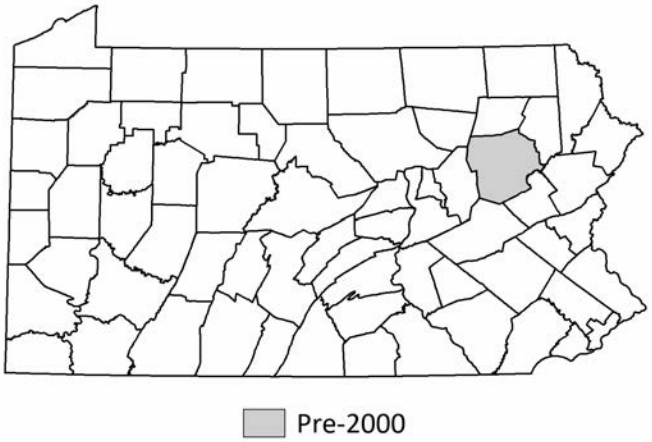
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Barrens with legume family plants

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitat due to conversion, fragmentation, and/or succession.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 4-Low

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A noctuid moth

Lithophane georgii

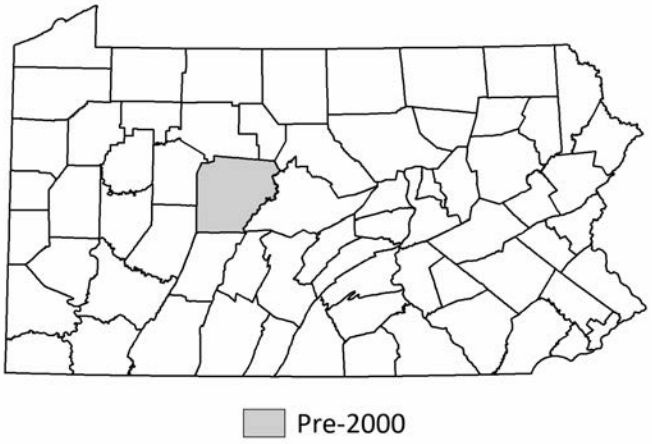
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: northern hardwood forests

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Appalachian (Hemlock)-Northern Hardwood Forest

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Loss of suitable habitat in Pennsylvania due to climate change.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 4-Low

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A noctuid moth

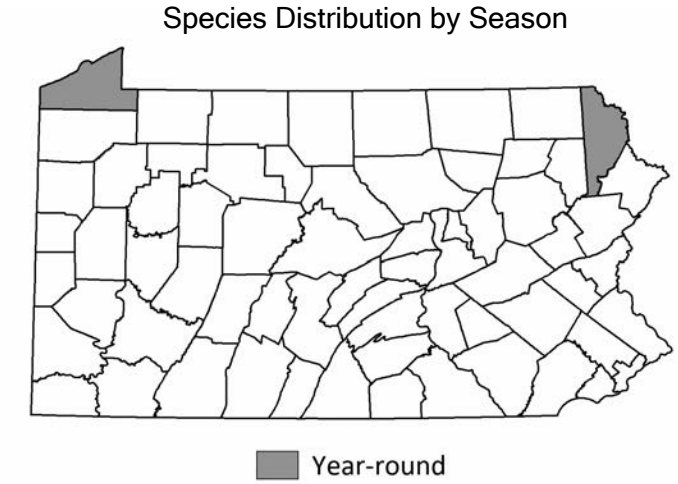
Bellura brehmei

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



N. Mullin



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: marshes with cattail (Typha latifolia and T. angustifolia)

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Freshwater Marsh

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Phyllira Tiger Moth

Apantesis phyllira

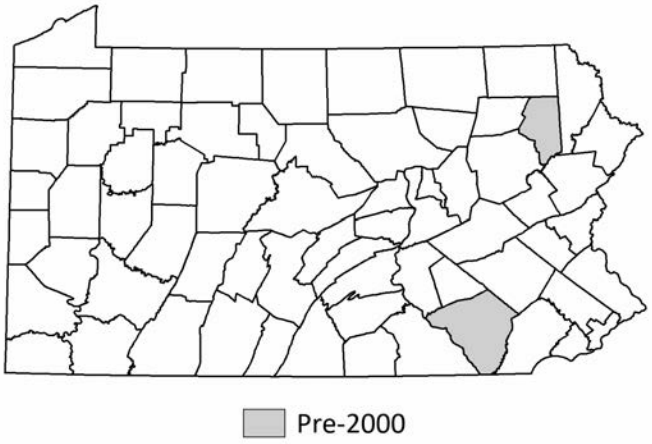
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



boverser

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open habitats with sandy soils. Host plants are a variety of forbs and grasses, including lupine (Lupinus) and corn (Zea mays).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: High - Medium

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Quivering Dart Moth

Aplectoides condita

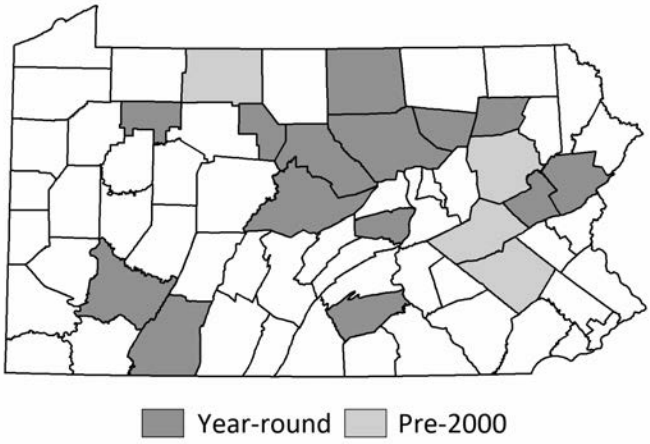
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Wet conifer forests, where it feeds preferably on larch (Larix laricina), but also a variety of other conifers, and possibly blueberries (Vaccinium).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Appalachian (Hemlock)-Northern Hardwood Forest

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

New Jersey Tea Inchworm Moth

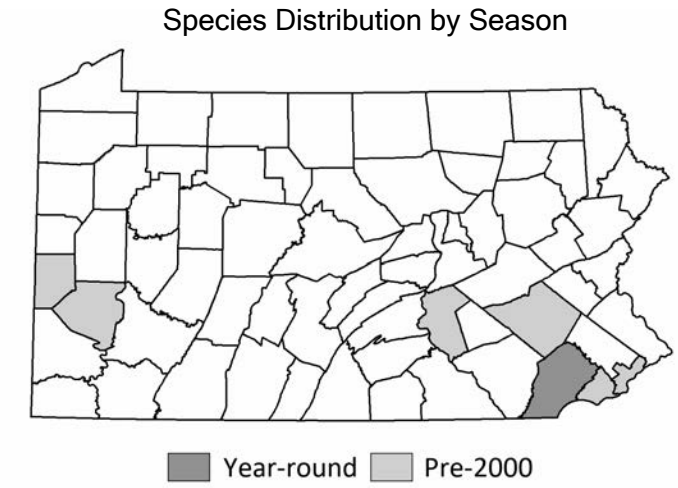
Apodrepanulatrix liberaria

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Leppo



Conservation Profile

PA 10-Year Conservation Goal: maintain known populations, and improve our knowledge of its distribution.

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open, rocky or sandy areas, in association with host plant, New Jersey tea (Ceanothus americanus).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High - Medium

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Install deer fencing around those populations of New Jersey Tea that are known to support specialist herbivores. If data is lacking, assume that larger populations harbor at least one of the SGCN specialists.

Objective: Protect 10 populations of New Jersey Tea with deer exclosures

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number and area of exclosures built; change in area of New Jersey Tea colony

Potential Collaborators: Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulate) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Encourage communication and share information between wildlife biologists, landowners / land managers, and utility companies

Objective: Facilitate communication between landowner/ land manager and utility companies to coordinate and adapt activities to optimize habitat for SGCN species while protecting utility resources. Share information on best practices for habitat management on right-of-ways to benefit SGCN insects and other wildlife.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Mowing is the preferred method for maintaining low vegetation on right-of-ways, and is least disruptive to wildlife when conducted between late fall and early spring. Best practices include managing habitats on a rotational basis, and disturbing less than a quarter of core open habitats in a year (provides refuge in unmanaged habitat). Allow shrubs and small trees to feather the edges between right-of-ways and the adjacent forest. Within right-of-ways, encourage patches of native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc. Herbicides may be needed to control resprouting trees and invasive plants.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: When conducting prescribed burns on state lands, identify New Jersey Tea stands within the project area, and incorporate them into the project planning.

Objective: Conduct the burning in patches to ensure that no more than 25% of the New Jersey Tea plants are disturbed by any one round of disturbance, and allow several years for recovery before additional patches of the plant are disturbed.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of burn projects containing New Jersey Tea. Percent of New Jersey Tea plants burned by each of those projects.

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulata) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification, information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High - Medium

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys for the six New Jersey Tea specialist SGCN should be conducted where medium to large patches of New Jersey Tea are found. Presence of one of these species is evidence that the patch may be large and stable enough to support some of the other species.	Universities & research institutions

No known monitoring programs.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Straight Lined Mallow Moth

Bagisara rectifascia

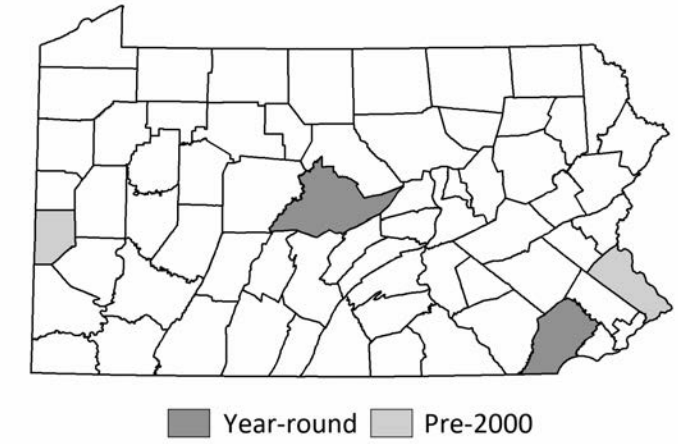
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Davis

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Variety of open habitats with host plants hazelnut (Corylus) and species in the Malvaceae family.

Primary Habitat: Open Upland

Primary Habitat Type: Shrublands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

Lamprinos, Matthew J., "Impact of whitetail deer overpopulation with hunting on the decline" (2021). English Department: Research for Change - Wicked Problems in Our World. 52.
Available at https://research.library.kutztown.edu/wickedproblems/52 (accessed June 2025).

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Pennsylvania Department of Conservation and Natural Resources. Conserving Forests and Native Plants through Deer Management. Available at https://www.pa.gov/agencies/dcnr/conservation/wildlife-biodiversity/biodiversity-managament/deer-management.html (accessed June 2025).

Pennsylvania Game Commission. Discover PA Wildlife - White-tailed Deer. Available at https://www.pa.gov/agencies/pgc/wildlife/discover-pa-wildlife/white-tailed-deer.html (accessed June 2025).

Tremblay, J-P., S.D. Cote, T. Rooney, and C. Dussault. 2014. Ecological impacts of deer overabundance on temperate and boreal forests. Article in Annual Review of Ecology Evolution and Systematics. 35:113-47. DOI:10.1146/annurev.ecolsys.35.021103.105725.

PENNSYLVANIA WILDLIFE ACTION PLAN

Boreal Fan Moth

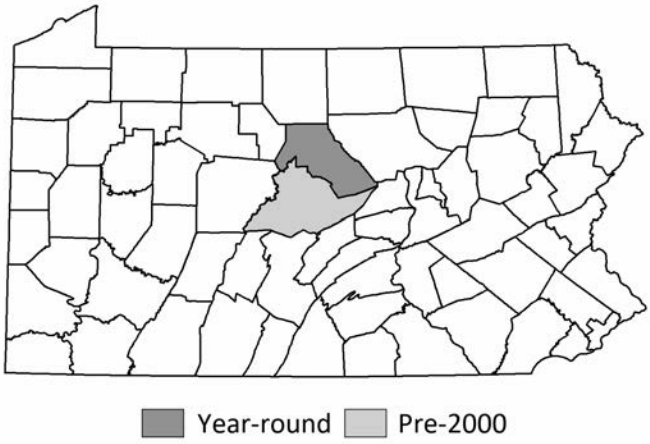
Brachionycha borealis

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Cold and high altitude oak forests, bogs, and pine barrens. Host plants are blueberries (Vaccinium), oaks (Quercus), and paper birch (Betula payrifera).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Curved Halter Moth

Capis curvata

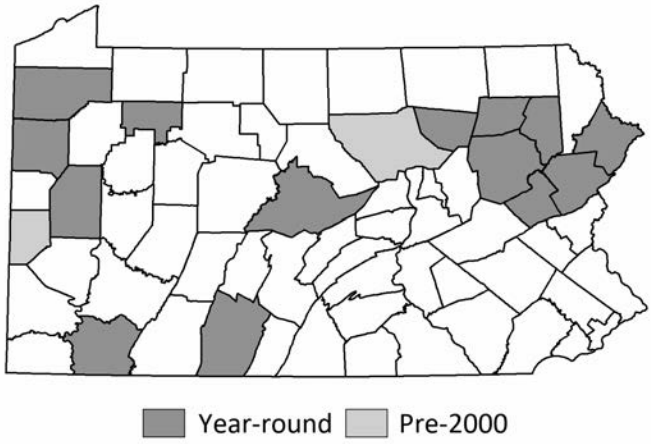
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Usually found in open wetlands.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Freshwater Marsh

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: Medium - Low

Specific Threat: Loss of suitable habitat in Pennsylvania due to climate change

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rare Sand Quaker Moth

Caradrina meralis

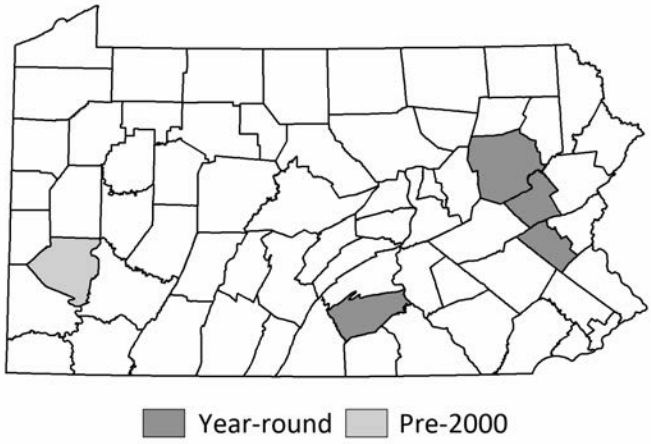
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Woodruff

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Dry, grassy habitat patches, likely feeds on grasses or herbs.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Loss of suitable habitat in Pennsylvania due to climate change.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Southern Pine Looper Moth

Caripeta aretaria

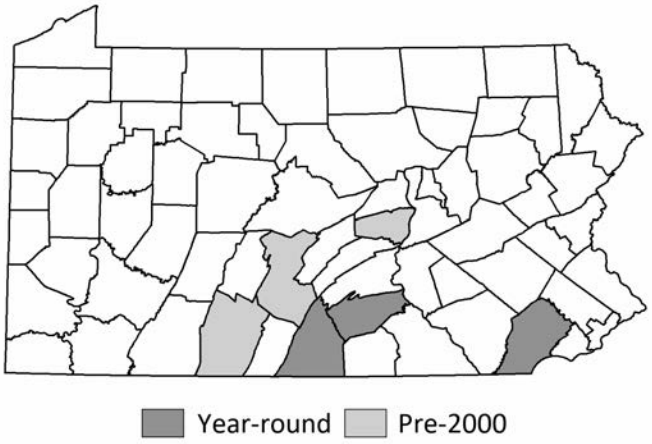
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Forests and thickets, likely specialized feeder on pines.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Pesticide treatments to control spongy moths is a threat.

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Angus' Underwing Moth

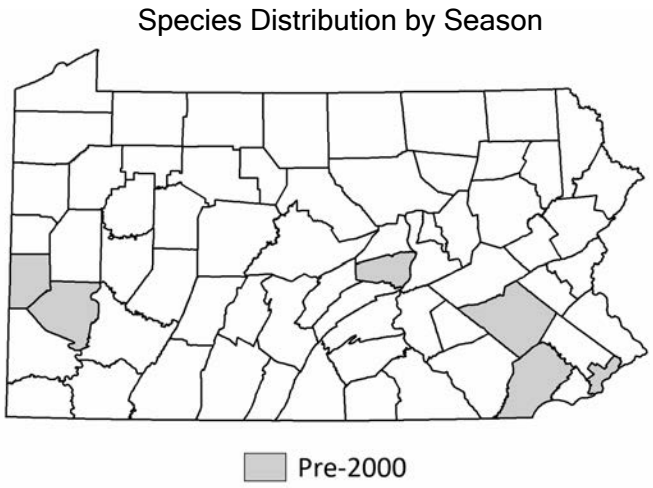
Catocala angusi

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Host plants are hickories (Carya).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Logging and Wood Harvesting **Threat Impact:** Low

Specific Threat: Clear cut and high grade timber practices

Action Category: Outreach, communication and distribution

Specific Action: Work with interested landowners & land managers to implement forestry best management practices to maintain a healthy forest and encourage regeneration of hickories (Carya spp.).

Objective: Work with interested landowners and land managers to identify stands of hickories (Carya spp.) on their property. Share information on habitat needs of the plant and its association with a rare moth. Provide voluntary best practices that can be implemented during habitat management activities such as timber harvests to protect and/or encourage regeneration of the host plant.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number land land owners / land managers contacted

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other species utilizing hickories (Carya spp.) in forests

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Dejected Underwing Moth

Catocala dejecta

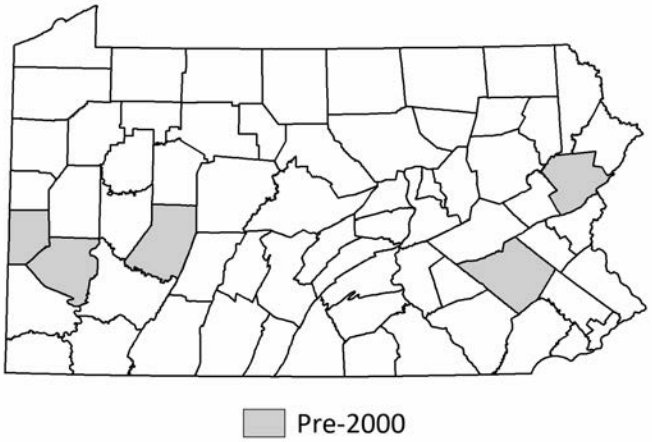
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Host plants are hickories (Carya) and oaks (Quercus).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Logging and Wood Harvesting **Threat Impact:** Low

Specific Threat: Clear cut and high grade timber practices

Action Category: Outreach, communication and distribution

Specific Action: Work with interested landowners & land managers to implement forestry best management practices to maintain a healthy forest and encourage regeneration of hickories (Carya spp.).

Objective: Work with interested landowners and land managers to identify stands of hickories (Carya spp.) on their property. Share information on habitat needs of the plant and its association with a rare moth. Provide voluntary best practices that can be implemented during habitat management activities such as timber harvests to protect and/or encourage regeneration of the host plant.

Action Priority: 4-Low **Action Urgency:** Initiate within 5 years **Measure:** Number land land owners / land managers contacted

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Other species utilizing hickories (Carya spp.) in forests

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Sweet Underwing Moth

Catocala dulciola

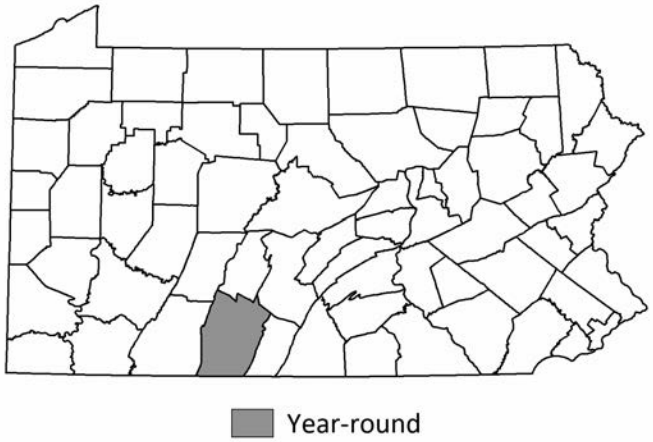
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



G. Cudworth

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Mostly found in hardwood forest, known to feed on hawthorn (Crataegus).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: High - Low

Specific Threat: pesticide spraying to control spongy moth (Lymantria dispar)

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium

Action Urgency: Initiate immediately

Measure: Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pine Woods Underwing Moth

Catocala sp. 1 nr. jair

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Dry oak woodlands and barrens. Host plants are oaks, scrub oak (Quercus ilicifolia) or blackjack oak (Quercus marilandica).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Umber Underwing Moth

Catocala umbrosa

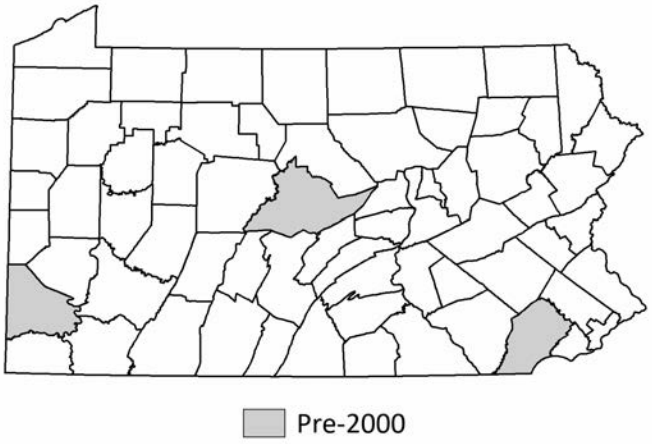
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Dry oak woodlands and pine barrens.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Bird Dropping Moth

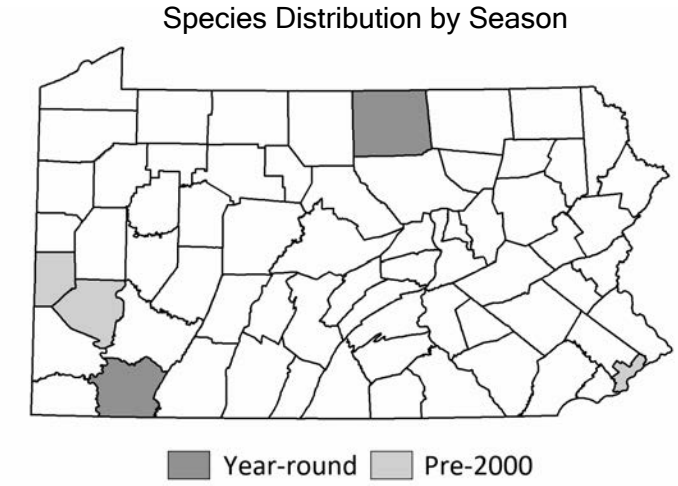
Cerma cora

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Dry, sandy woods. Feeds on a variety of small trees and shrubs in the Rosaceae family, especially pin cherry (Prunus pensylvanica).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Low

Specific Threat: Fire may help create and rejuvenate habitat, but as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Waxed Sallow Moth

Chaetaglaea cerata

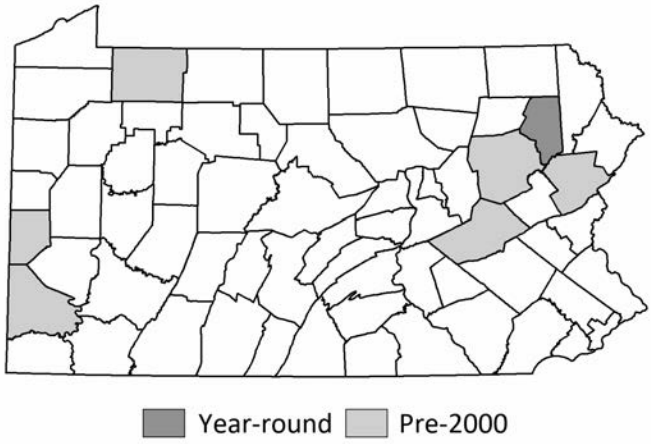
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Blayney

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Woodlands, dry fields, abandoned orchards, thickets, and barrens. Host plant are a variety of Prunus sp, and possibly other shrubby barrens plants.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Trembling Sallow Moth

Chaetaglaea rhonda

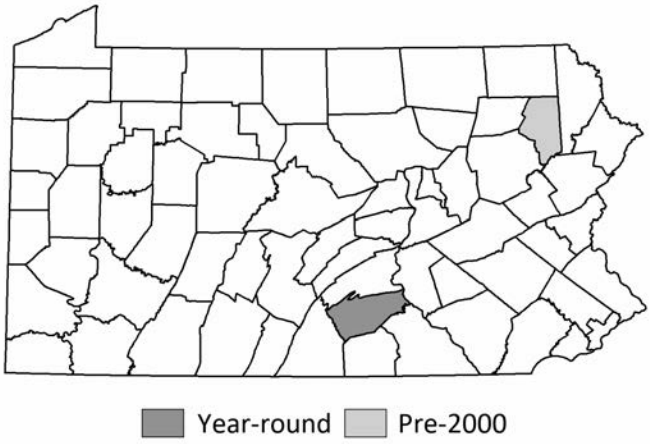
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Acidic heathlands and barrens. Feeds primarily on lowbush blueberry (Vaccinium angustifolium), but also oaks (Quercus) and cherries (Prunus).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Northern Appalachian-Acadian Rocky Heath Outcrop

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pine Barrens Fungus Moth

Chytonix sensilis

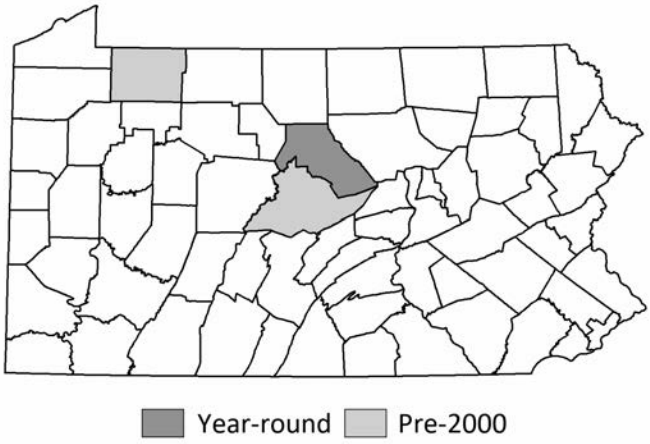
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Open woods and dry, sandy habitats, such as barrens, near water bodies or wetlands. Feeds on fungi.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Melsheimer's Sack Bearer Moth

Cicinnus melsheimeri

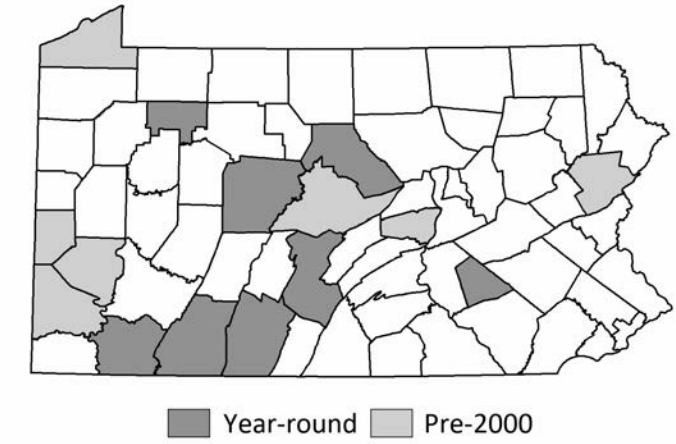
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Primarily found in sandy oak barrens. Preferred host plant is scrub oak (Quercus ilicifolia).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pine Devil Moth

Citheronia sepulcralis

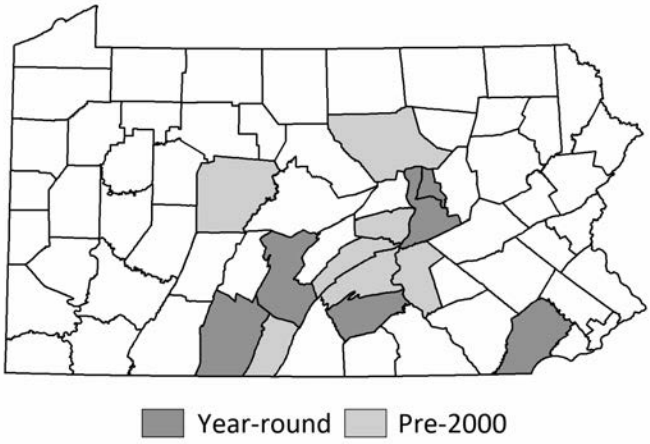
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Pine woodlands. Host plant a variety of pines.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth biocontrol agent (Compsilura concinnata)

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Grote's Sallow Moth

Copivaleria grotei

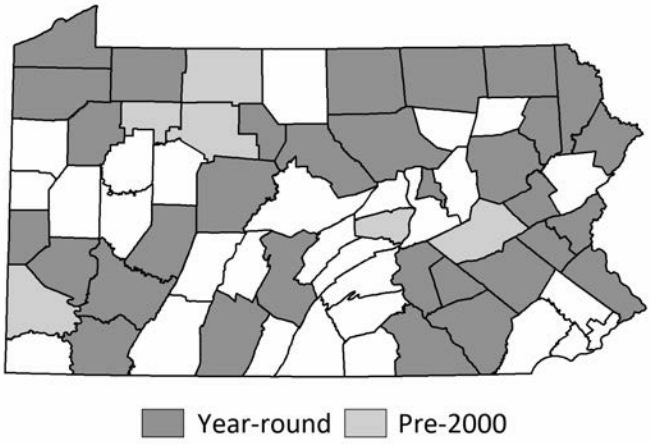
Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Hodnett

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Avoid the extirpation of this moth from Pennsylvania

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-80%

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Specializes on ash (Fraxinus). Any forest with ash trees; upland or palustrine; not the northern acidic types.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, presumably persisting on ash saplings (and to some extent on Chionanthus), but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pure Lichen Moth

Crambidia pura

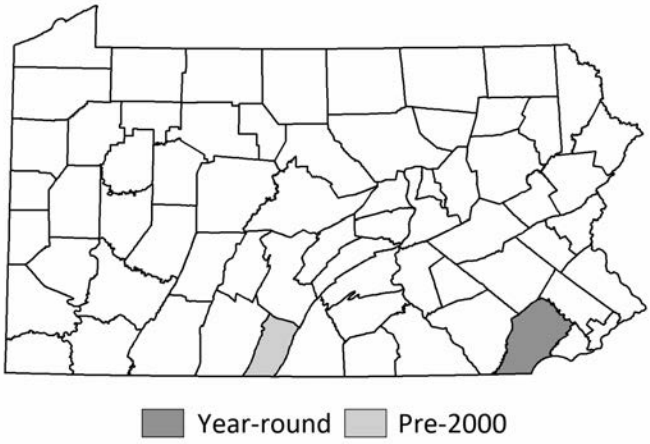
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Niznik

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Thickets and barrens. Likely feeds on lichens.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

The Pink Streak Moth

Dargida rubripennis

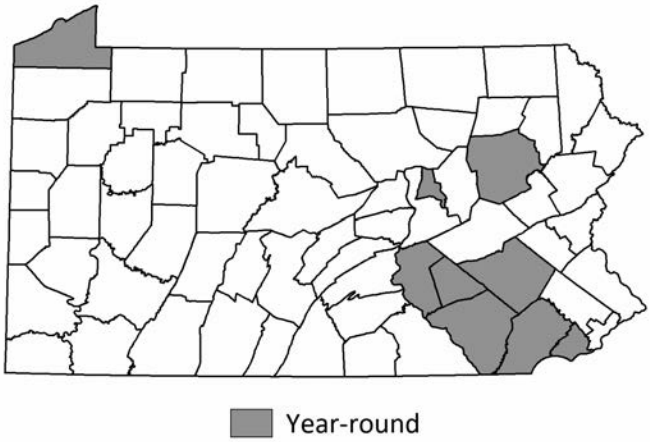
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: A range of mostly sandy, grassy habitats, such as prairies, dunes, and roadsides. Host plants are grasses, including crabgrasses (Digitaria) and switchgrass (Panicum virgatum).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: High - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** High - Low

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Post-burn Datana Moth

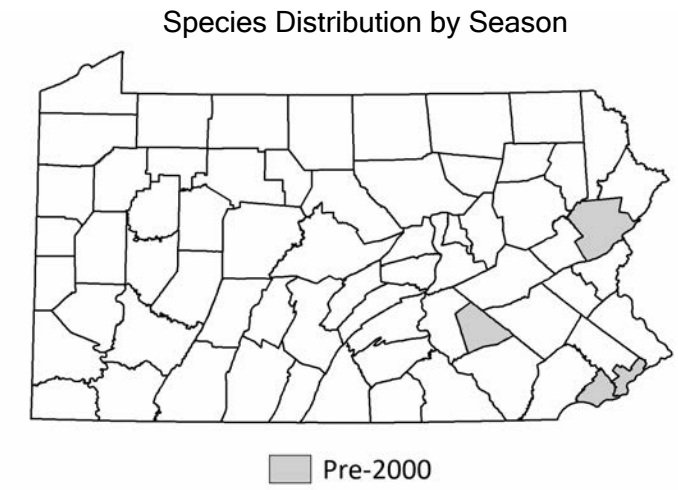
Datana ranaeceps

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Dry, open woodlands and shrublands. Host plants vary, but include staggerbush (Lyonia mariana) and blueberries (Vaccinium).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Physiographic Province: Piedmont, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Ridge and Valley. Physiographic Section: Piedmont Upland, Glaciated Pocono Plateau, Glaciated Low Plateau, Great Valley, Blue Mountain

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: War, Civil Unrest and Military Exercises **Threat Impact:** Medium - Low

Specific Threat: Land use modification and change as part of military training exercises or other purposes.

Action Category: Conservation planning

Specific Action: Incorporate SGCN moths, butterflies, and other invertebrates into plans for developing and implementing training, development, and other activities. Identify protocols and best practices to reduce negative impacts and improve habitats for at-risk species where possible.

Objective: Develop operational, management and implementation plans that outline procedures for avoiding and mitigating negative impacts of military activities and projects on SGCN invertebrates and their habitats. Develop plans to manage and improve habitats so that populations of at-risk wildlife are able to withstand localized disturbances.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of military bases incorporating SGCN invertebrates into plans in order to avoid or mitigate negative impacts to species and habitats and to manage and protect populations where possible.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Physiographic Province: Ridge and Valley, Ridge and Valley, Ridge and Valley, Ridge and Valley, Ridge and Valley. Physiographic Section: Appalachian Mountain, Susquehanna Lowland, Anthracite Upland, Blue Mountain

Other species likely to benefit from this action: Other SGCN invertebrates on military installations

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rubifera Dart Moth

Diarsia rubifera

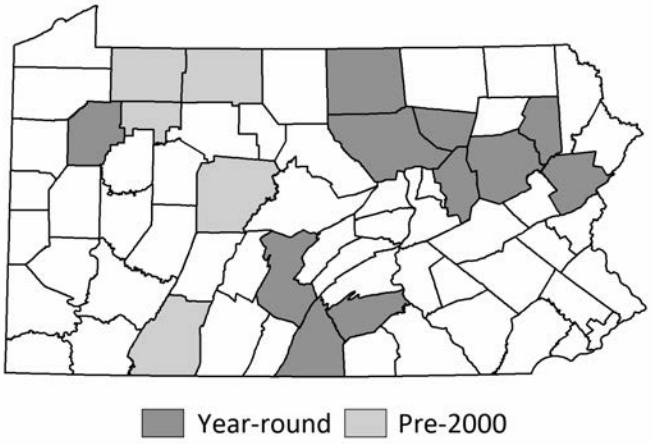
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Heathlands, including rocky woodlands and bogs. Host plant are blueberries (Vaccinium).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Grote's Black-tipped Quaker Moth

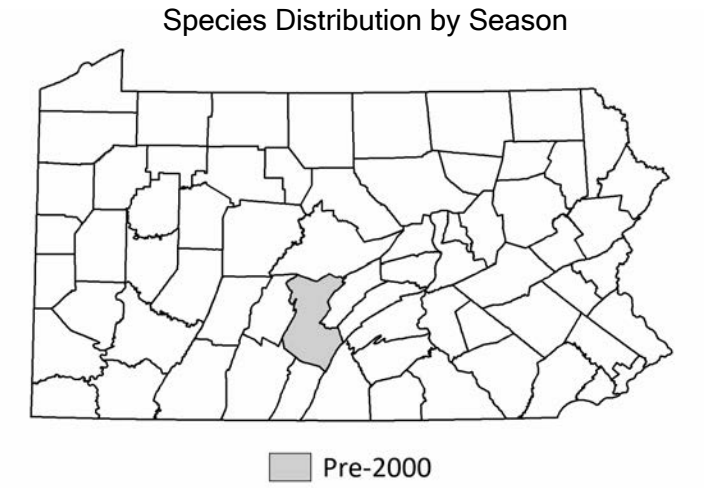
Dichagyris grotei

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Sexton



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Thickets and barrens.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** High - Medium

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pointed Sallow Moth

Epiglaea apiata

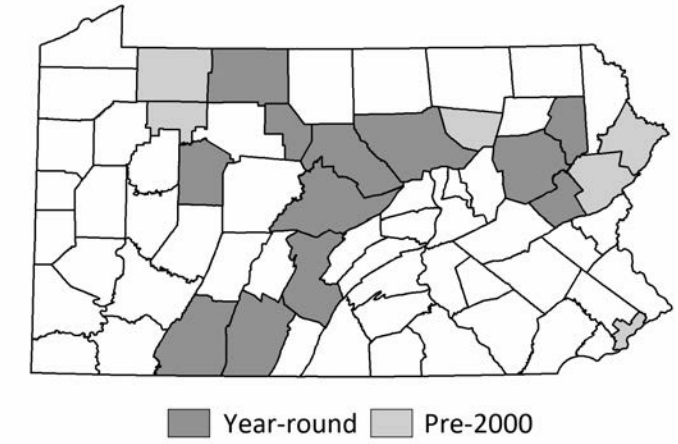
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open heathland or wet moist pinelands. Host plants are cranberries and blueberries (Vaccinium sp.).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Low

Specific Threat: Fire may help create and rejuvenate habitat, but as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Broad-lined Erastria Moth

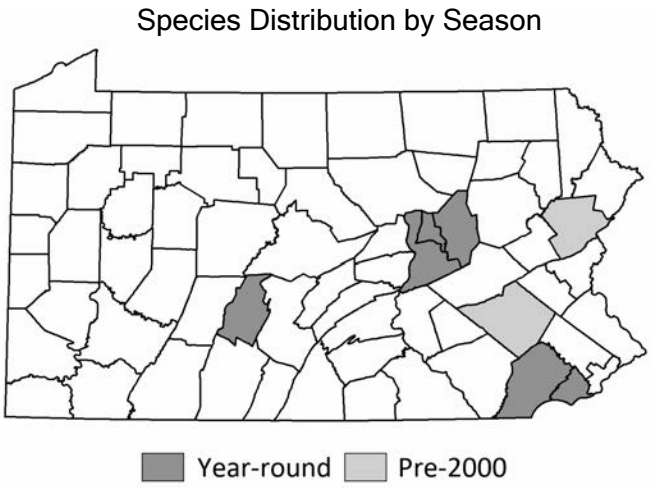
Erastria coloraria

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open, rocky or sandy areas, particularly barrens, in association with host plant, New Jersey tea (Ceanothus americanus).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High - Medium

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Install deer fencing around those populations of New Jersey Tea that are known to support specialist herbivores. If data is lacking, assume that larger populations harbor at least one of the SGCN specialists.

Objective: Protect 10 populations of New Jersey Tea with deer exclosures

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number and area of exclosures built; change in area of New Jersey Tea colony

Potential Collaborators: Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulata) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Encourage communication and share information between wildlife biologists, landowners / land managers, and utility companies

Objective: Facilitate communication between landowner/ land manager and utility companies to coordinate and adapt activities to optimize habitat for SGCN species while protecting utility resources. Share information on best practices for habitat management on right-of-ways to benefit SGCN insects and other wildlife.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Can wait 10 years to initiate

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High - Medium

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys for the seven New Jersey Tea specialist SGCN should be conducted where medium to large patches of New Jersey Tea are found. Presence of one of these species is evidence that the patch may be large and stable enough to support some of the other species.	

No known monitoring programs.

Lamprinos, Matthew J., "Impact of whitetail deer overpopulation with hunting on the decline" (2021). English Department: Research for Change - Wicked Problems in Our World. 52.
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Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Marsh Fern Moth

Fagitana littera

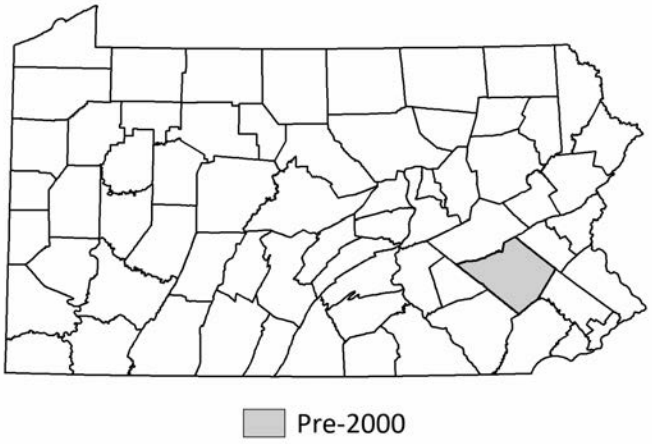
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Wetlands, especially bogs, where marsh-fern (Thelypteris palustris) is found.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Invasives displace native host and nectar plants and degrade habitats.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and areas with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Blueberry Gray Moth

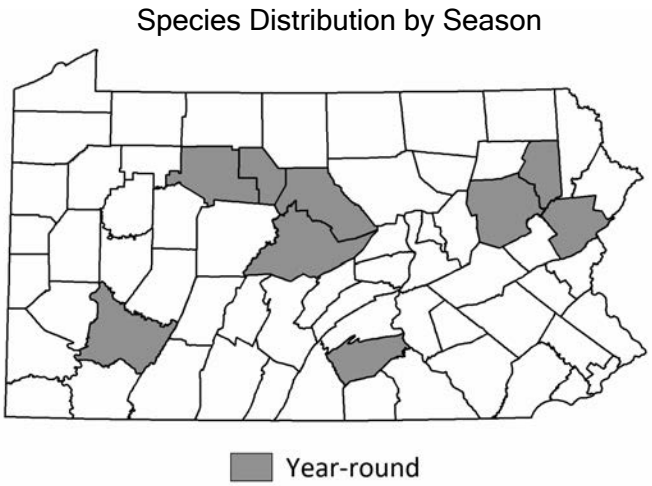
Glena cognataria

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Peat bogs and open heath barrens. Host plant are a variety of blueberries (Vaccinium).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Low

Specific Threat: Fire may help create and rejuvenate habitat, but as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rare Spring Moth

Heliomata infulata

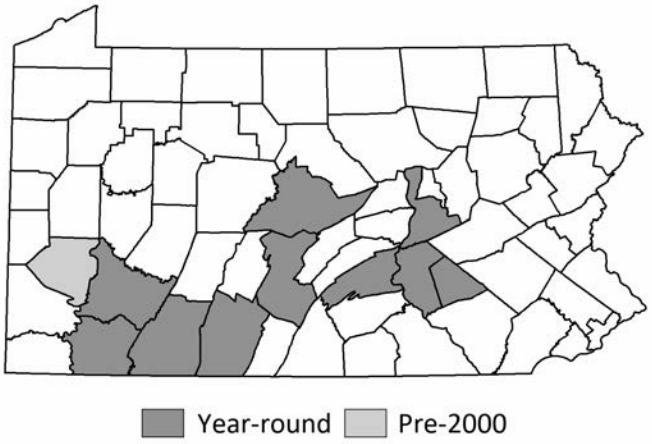
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Likely dry forests and thickets. Primary host plant is bristly locust (Robinia hispida).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Pesticide treatments to control spongy moths is a threat.

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Slender Clearwing Moth

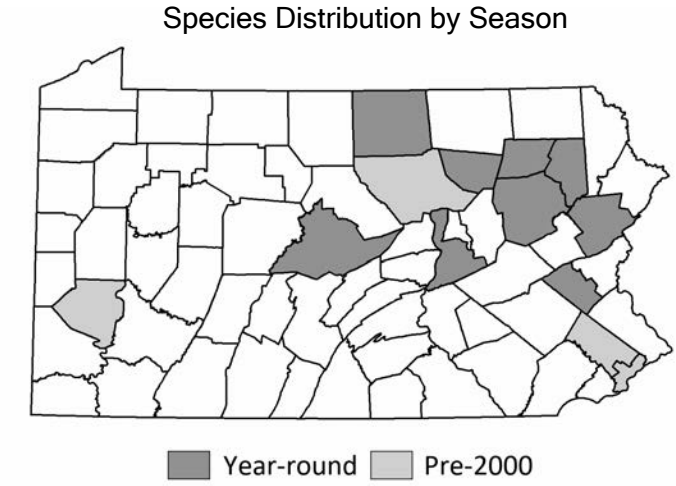
Hemaris gracilis

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Most often found in extensive forest and barrens complexes. Host plants are heath shrubs (primarily Vaccinium).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Northern Appalachian-Acadian Rocky Heath Outcrop

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Fire may help create and rejuvenate habitat, but as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Spongy moth biocontrol agent (Compsilura concinnata)

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

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Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Eastern Buckmoth

Hemileuca maia

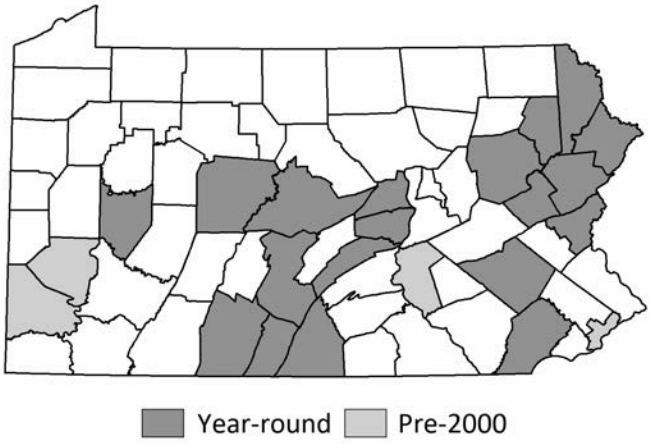
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Oak woodlands, forests, and barrens. Host plants are oaks (Quercus), preference for scrub oak (Quercus ilicifolia).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Spongy moth pesticide spray, and spongy moth biocontrol agent (Compsilura concinnata)

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

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Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Sundew Cutworm Moth

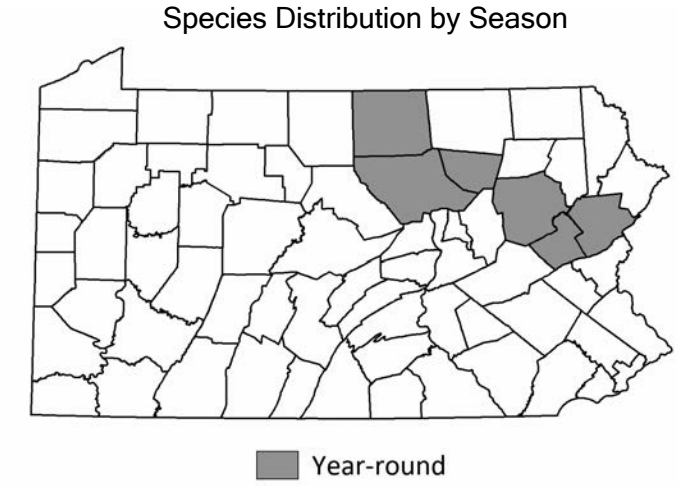
Hemipachnobia monochromatea

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Acid bogs, where it feeds on host plants sundew (Drosera) and blueberries (Vaccinium).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: Medium - Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

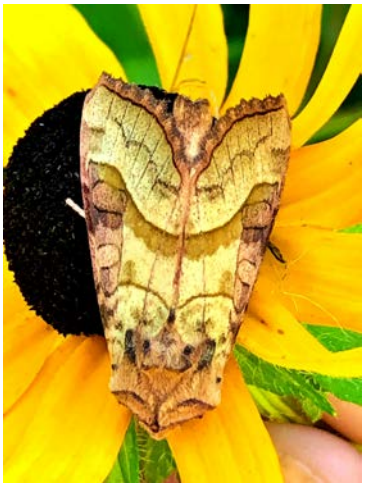
PENNSYLVANIA WILDLIFE ACTION PLAN

Figwort Borer Moth

Hydraecia stramentosa

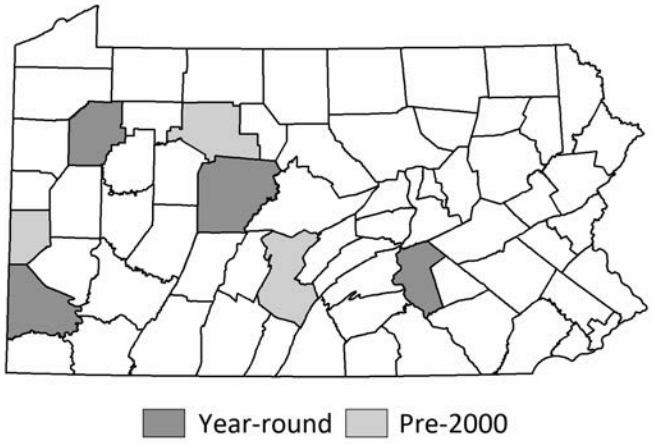
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



safechrislaurie

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Wide variety of habitats including old fields, roadsides, wetlands, and hilly forests. Host plants are false foxgloves (Aureolaria) and figworts (Scrophularia).

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Straw Wave Moth

Idaea eremiata

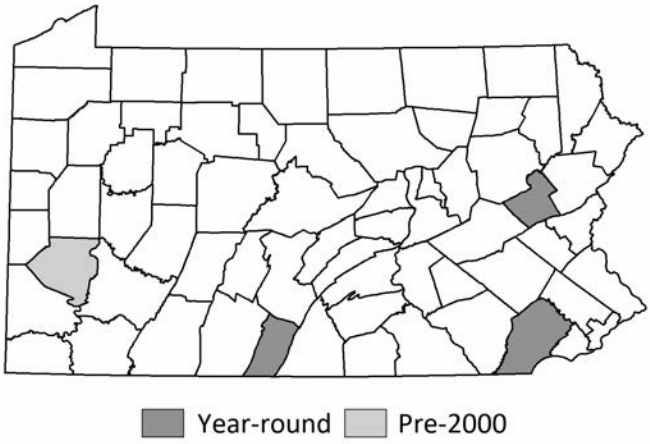
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Forests, feeds on oaks (Quercus).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Fire may help create and rejuvenate habitat, but as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Medium - Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Encourage communication and share information between wildlife biologists, landowners / land managers, and utility companies

Objective: Facilitate communication between landowner/ land manager and utility companies to coordinate and adapt activities to optimize habitat for SGCN species while protecting utility resources. Share information on best practices for habitat management on right-of-ways to benefit SGCN insects and other wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Medium - Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Violaceous Wave Moth

Idaea violacearia

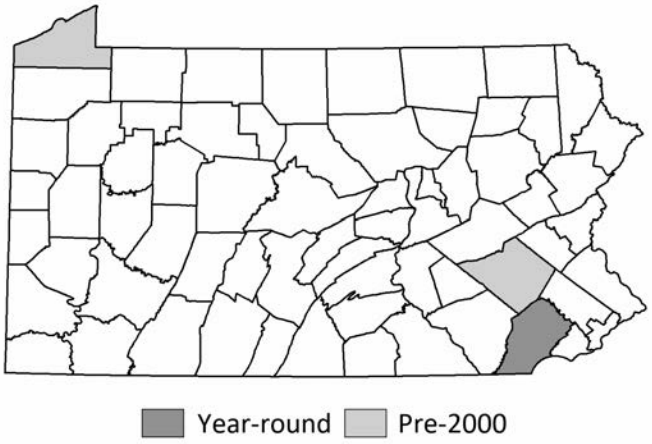
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Specialized scrub oak feeder (Quercus ilicifolia), known from serpentine barren habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Serpentine Barren / Woodland

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Low

Specific Threat: Fire may help create and rejuvenate habitat, but as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Medium - Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Encourage communication and share information between wildlife biologists, landowners / land managers, and utility companies

Objective: Facilitate communication between landowner/ land manager and utility companies to coordinate and adapt activities to optimize habitat for SGCN species while protecting utility resources. Share information on best practices for habitat management on right-of-ways to benefit SGCN insects and other wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Medium - Low

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Fingered Lemmeria Moth

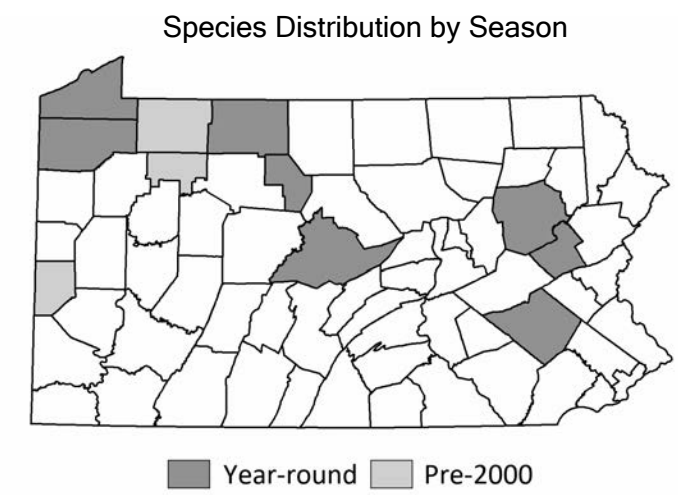
Lemmeria digitalis

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



najas



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Found in wet areas such as wet maple groves and bogs.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

American Brindle Moth

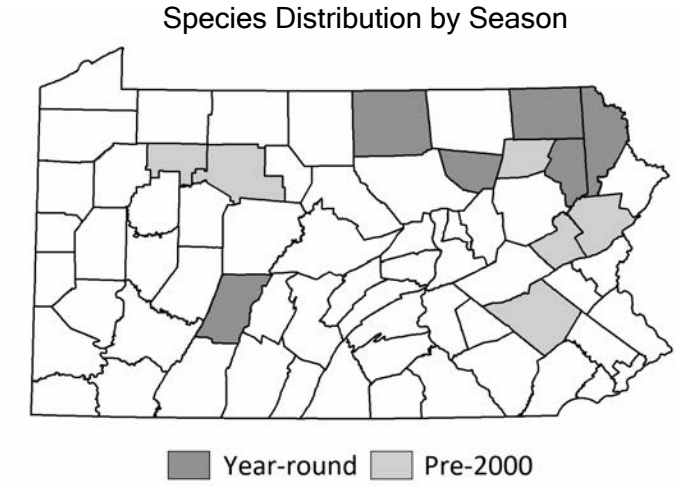
Lithomoia germana

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Shorelines, fields, and wetlands. Feeds on a variety of woody plants, including blueberries (Vaccinium), Labrador tea (Ledum groenlandicum), and willow (Salix).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium - Low

Specific Threat: Pennsylvania is near the southern edge of the species range.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Franclemont's Lithophane Moth

Lithophane franclemonti

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G2G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Most frequently found in rich northern hardwood forests. Host plant unknown but is likely a shrub or understory tree.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Appalachian (Hemlock)-Northern Hardwood Forest

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** High - Low

Specific Threat: Habitat loss to conversion, succession, and fragmentation, especially for those populations associated with prairie ecotones

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Thaxter's Pinion Moth

Lithophane thaxteri

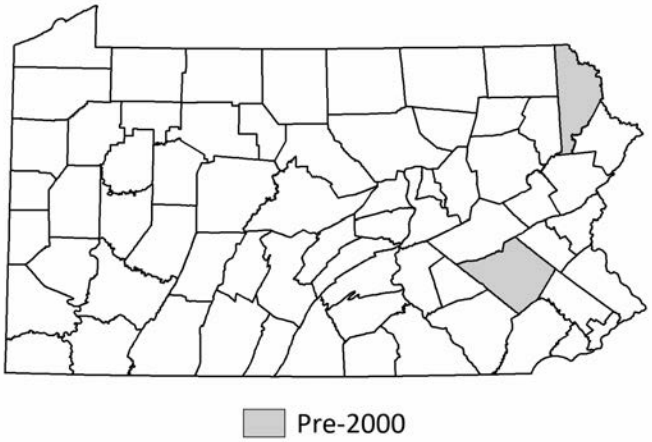
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Northern pine barrens, heathlands, bogs, marshes, and sandy woodlands. Host plants include blueberries (Vaccinium), tamarack (Larix laricina), and sweet gale (Myrica gale).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Medium

Specific Threat: Loss of suitable habitat in Pennsylvania due to climate change.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 4-Low **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Twilight Moth

Lycia rachelae

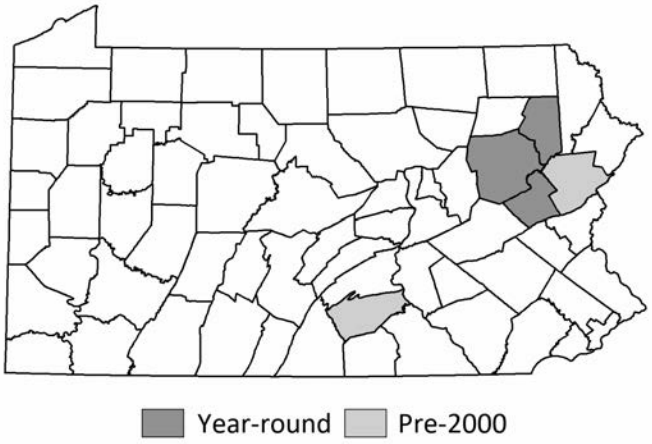
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Acidic, sandy barrens, particularly along ridgetops, and sometimes near wetlands. Feeds on a wide variety of woody plants.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium - Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Barrens Itame Moth

Macaria exonerata

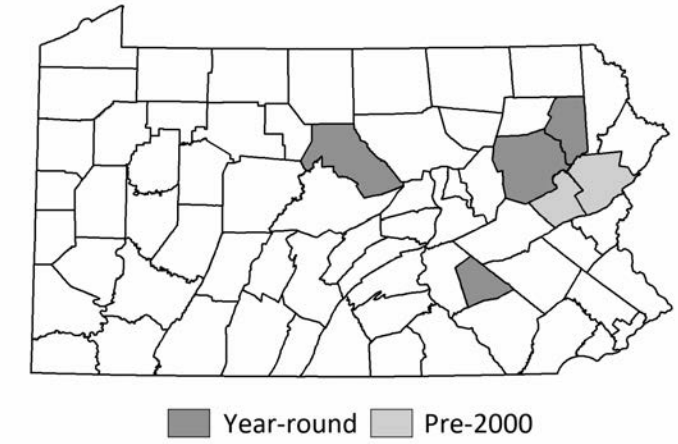
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Primarily found in pine barrens, where the host plant is likely scrub oak (Quercus ilicifolia), and possibly also lowbush blueberry (Vaccinium angustifolium).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Pollinators of barrens and woodland habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Unknown

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

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Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Promiscuous Angle Moth

Macaria promiscuata

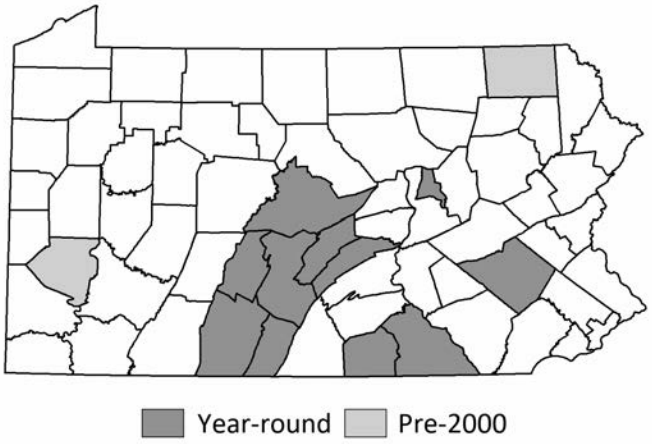
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Woodlands and forests, in association with redbud (Cercis canadensis), on calcareous soils.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of small limestone and shale barrens, woodlands and glades to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Twin-dotted Macrochilo Moth

Macrochilo hypocritalis

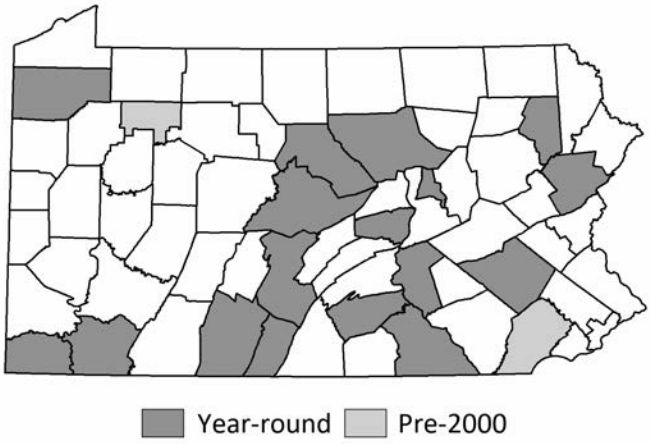
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Found in bogs, fens, and marshes.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ash Sphinx Moth

Manduca jasminearum

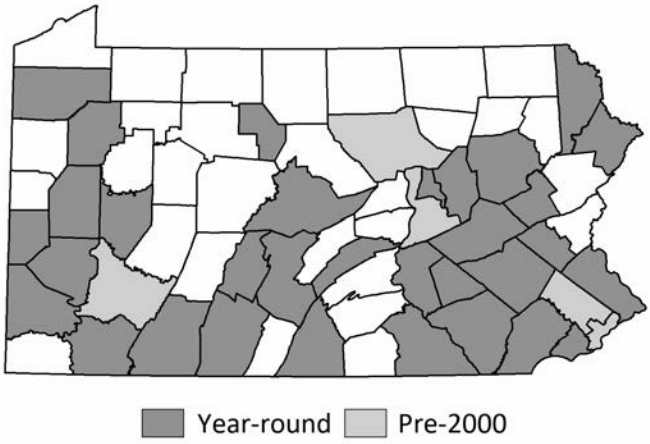
Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3?

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-70%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specializes on ash trees (Fraxinus spp.).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, most likely persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years. This species has been known to use introduced lilacs (Syringa) as a host, but the possibility for a population to persist on Syringa is unproven.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Physiographic Province: Ridge and Valley, Piedmont, New England, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus. Physiographic Section: Eastern Lake, Northwestern Glaciated Plateau, High Plateau, Pittsburgh Low Plateau, Allegheny Front, Allegheny Mountain, Waynesburg Hills

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Barrens Metarranthis Moth

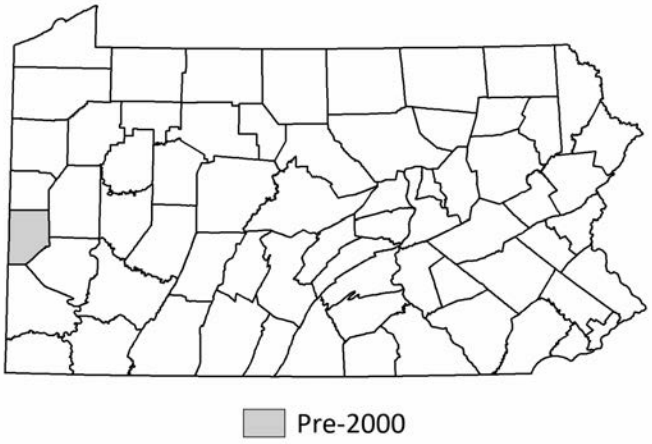
Metarranthis apiciaria

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G1G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Likely dry rocky forests or woodlands, most often found in pine or oak barrens.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Early Metarranthis Moth

Metarranthis sp. 3

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: forests, clearings, and meadows.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Tuscarora Emerald Moth

Nemoria tuscarora

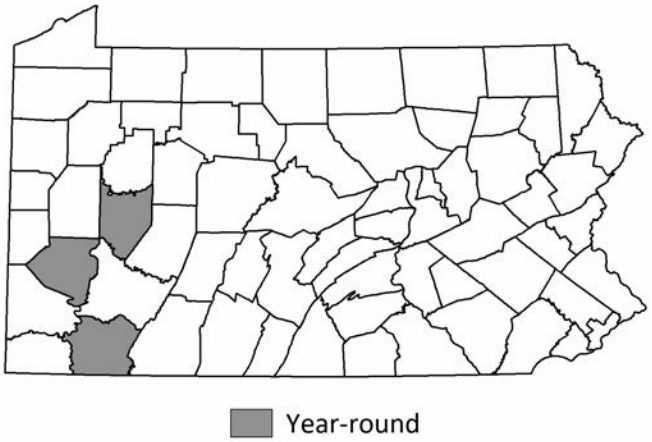
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Yeany

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GU

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Host plants are bushy St. John's Wort (Hypericum densiflorum) and shrubby St. John's Work (H. prolificum). H. densiflorum occurs in wet shrublands, and H. prolificum occurs in upland meadows.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and areas with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Northern Brocade Moth

Neoligia semicana

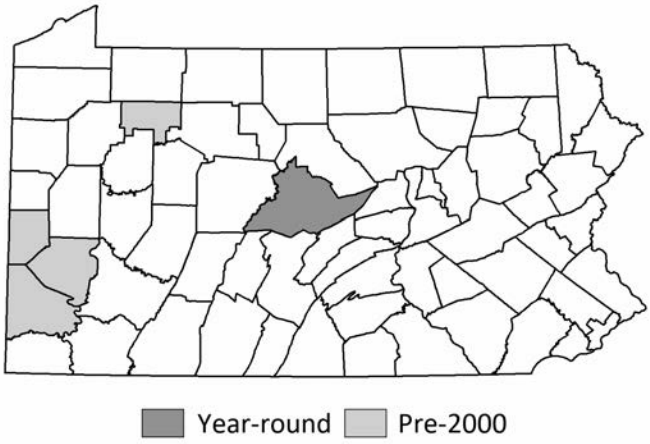
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



indianasteve

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G2G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Found primarily in wet bogs, salt marshes, and other brackish places.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: High - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

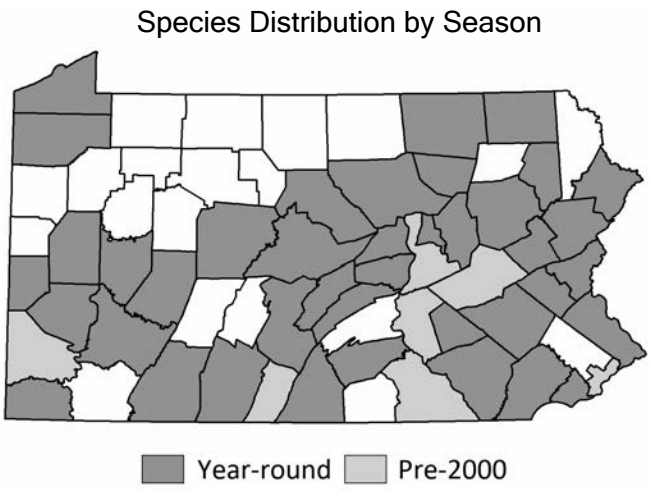
The Angel Moth

Olceclostera angelica

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >90%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Feeds on ash (Fraxinus) and also lilac (Syringa).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Very High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, perhaps persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years. This species has been known to use Chionanthus virgincus as a host, but the possibility for a population to persist on this PA rare species has not been demonstrated.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Splendid Palpita Moth

Palpita magniferalis

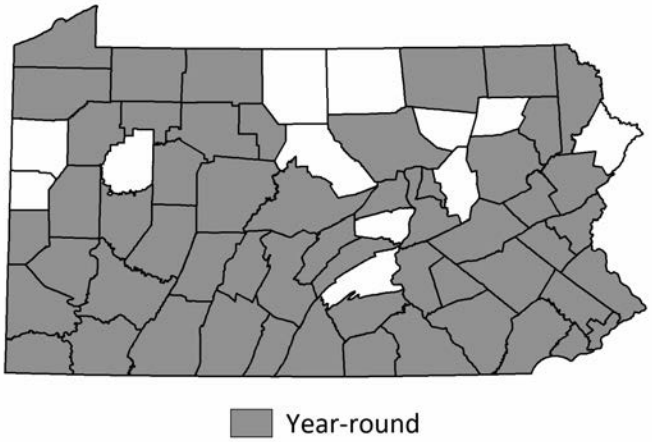
Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-80%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specializes on ash trees (Fraxinus spp.).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. P. magniferalis has so far been successful in persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Yellow Stoneroot Borer Moth

Papaipema astuta

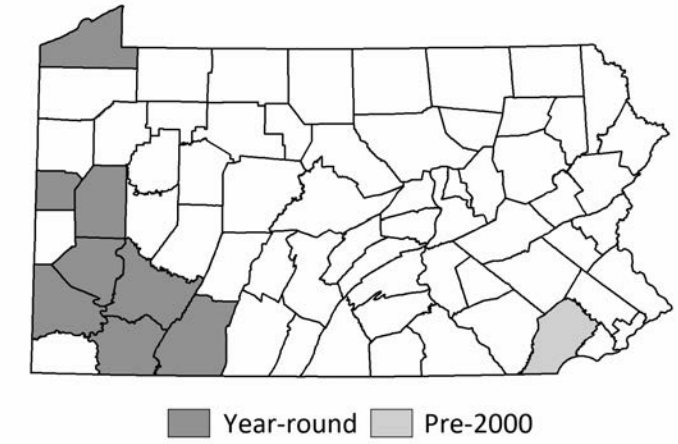
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3?

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: Rich forested areas with abundant populations of food plant, horse-balm (Collinsonia canadensis).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: South-Central Interior Mesophytic Forest

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Medium

Specific Threat: Invasive plants and worms and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Problematic Native Species/Diseases

Threat Impact: Very High - Medium

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

Lamprinos, Matthew J., "Impact of whitetail deer overpopulation with hunting on the decline" (2021). English Department: Research for Change - Wicked Problems in Our World. 52.
Available at https://research.library.kutztown.edu/wickedproblems/52 (accessed June 2025).

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Pennsylvania Department of Conservation and Natural Resources. Conserving Forests and Native Plants through Deer Management. Available at https://www.pa.gov/agencies/dcnr/conservation/wildlife-biodiversity/biodiversity-managament/deer-management.html (accessed June 2025).

Pennsylvania Game Commission. Discover PA Wildlife - White-tailed Deer. Available at https://www.pa.gov/agencies/pgc/wildlife/discover-pa-wildlife/white-tailed-deer.html (accessed June 2025).

Tremblay, J-P., S.D. Cote, T. Rooney, and C. Dussault. 2014. Ecological impacts of deer overabundance on temperate and boreal forests. Article in Annual Review of Ecology Evolution and Systematics. 35:113-47. DOI:10.1146/annurev.ecolsys.35.021103.105725.

PENNSYLVANIA WILDLIFE ACTION PLAN

Dark Stoneroot Borer Moth

Papaipema duplicata

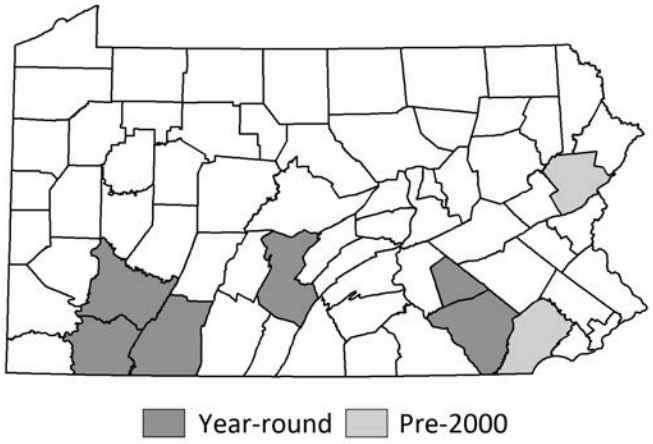
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G1G2

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: Rich hardwood forest with host plant, horse-balm (Collinsonia canadensis).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: South-Central Interior Mesophytic Forest

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Medium

Specific Threat: Invasive plants and worms and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Problematic Native Species/Diseases

Threat Impact: Very High - Medium

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

Lamprinos, Matthew J., "Impact of whitetail deer overpopulation with hunting on the decline" (2021). English Department: Research for Change - Wicked Problems in Our World. 52.
Available at https://research.library.kutztown.edu/wickedproblems/52 (accessed June 2025).

Natural Lands. What is the Most Dangerous Animal in Pennsylvania? Finding Balance. Available at https://www.natlands.org/news/finding-balance/ (accessed June 2025).

Pennsylvania Department of Conservation and Natural Resources. Conserving Forests and Native Plants through Deer Management. Available at https://www.pa.gov/agencies/dcnr/conservation/wildlife-biodiversity/biodiversity-managament/deer-management.html (accessed June 2025).

Pennsylvania Game Commission. Discover PA Wildlife - White-tailed Deer. Available at https://www.pa.gov/agencies/pgc/wildlife/discover-pa-wildlife/white-tailed-deer.html (accessed June 2025).

Tremblay, J-P., S.D. Cote, T. Rooney, and C. Dussault. 2014. Ecological impacts of deer overabundance on temperate and boreal forests. Article in Annual Review of Ecology Evolution and Systematics. 35:113-47. DOI:10.1146/annurev.ecolsys.35.021103.105725.

PENNSYLVANIA WILDLIFE ACTION PLAN

Joe-Pye Weed Borer Moth

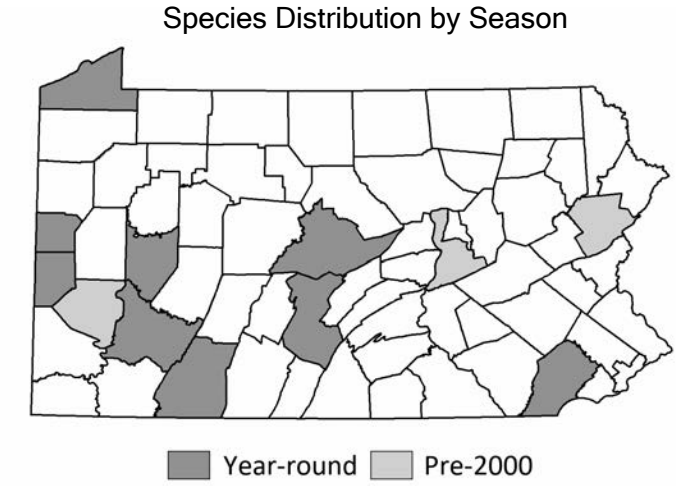
Papaipema eupatorii

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open wet meadows. Joe-pye weed (Eupatorium sp.) is the host plant.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

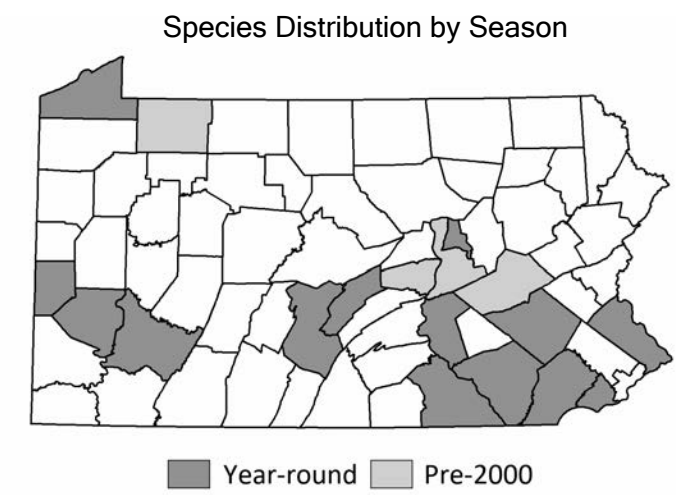
Ash Tip Borer Moth

Papaipema furcata

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-80%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Forests and woodlands; the caterpillars feed on ash trees (Fraxinus spp).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, presumably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Veronia Borer Moth

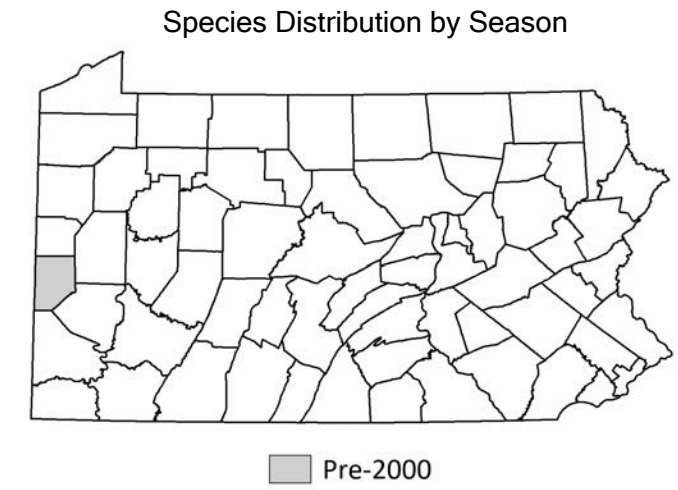
Papaipema limpida

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G2G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open woodlands and early successional habitats with food plant; caterpillars feed on giant ironweed (Vernonia gigantea).

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** High - Medium

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** High - Medium

Specific Threat: Loss of wetland and riparian habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Loosestrife Borer Moth

Papaipema lysimachiae

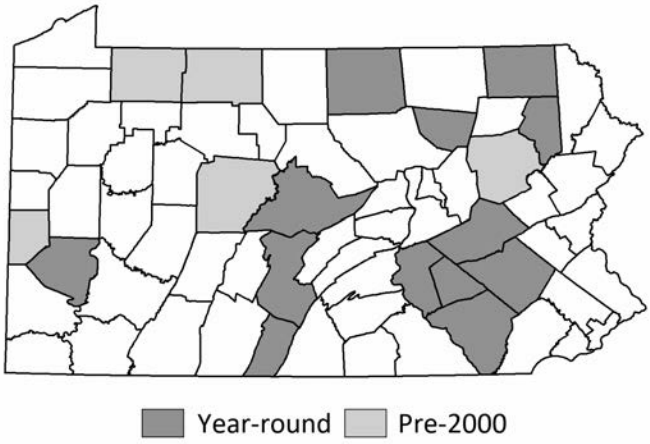
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Feeds on swamp loosestrife (Lysimachia terrestris), a wetland species, and whorled yellow loosestrife (Lysimachia quadrifolia), which primarily grows in dry, open, sandy or rocky forests.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Brick-red Borer Moth

Papaipema marginidens

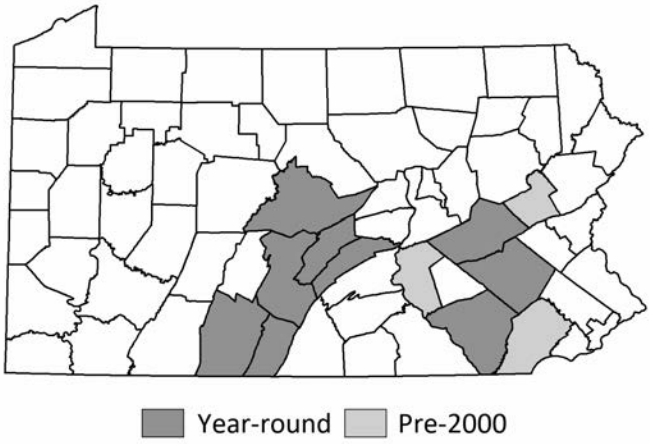
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: high quality woodlands and barrens, often along stream corridors, where the host plant wild yam (Dioscorea villosa) grows.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and areas with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Maritime Sunflower Borer Moth

Papaipema maritima

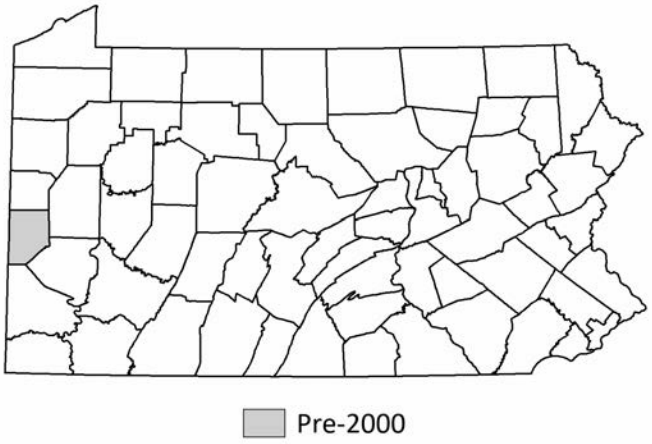
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3?

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Mesic and wet-mesic prairie and old fields with host plant, giant sunflower (Helianthus giganteus).

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Medium

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and areas with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Sunflower Borer Moth

Papaipema necopina

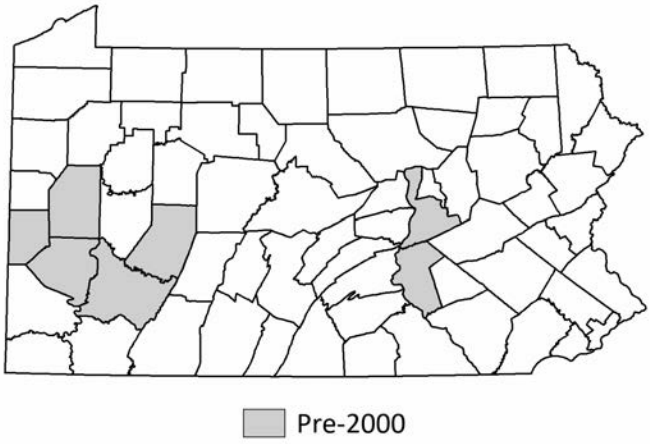
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Mossman

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: In association with woodland sunflowers (Helianthus sp.).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: High - Medium

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites and areas with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Coneflower Borer Moth

Papaipema nelita

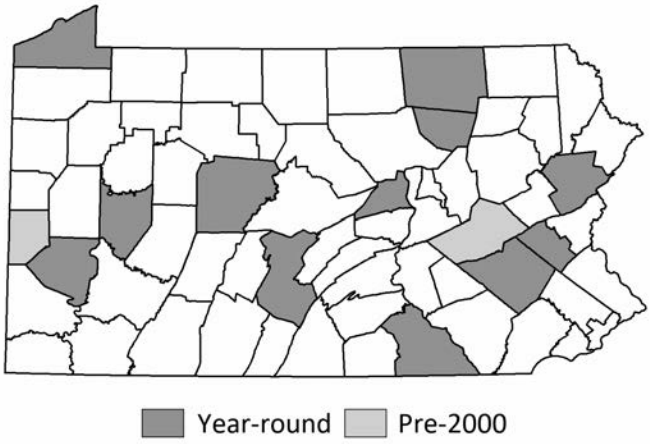
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Yeany

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Host plants are tall coneflower (Rudbeckia laciniata) and also burdocks (Arctium sp.).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Turtle Head Borer Moth

Papaipema nepheleptena

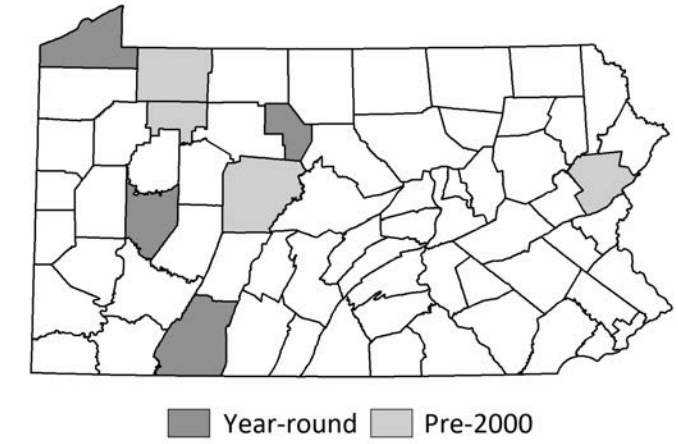
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: In wet areas, with host plant turtlehead (Chelone glabra).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Low

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

Lamprinos, Matthew J., "Impact of whitetail deer overpopulation with hunting on the decline" (2021). English Department: Research for Change - Wicked Problems in Our World. 52.
Available at https://research.library.kutztown.edu/wickedproblems/52 (accessed June 2025).

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Tremblay, J-P., S.D. Cote, T. Rooney, and C. Dussault. 2014. Ecological impacts of deer overabundance on temperate and boreal forests. Article in Annual Review of Ecology Evolution and Systematics. 35:113-47. DOI:10.1146/annurev.ecolsys.35.021103.105725.

PENNSYLVANIA WILDLIFE ACTION PLAN

Mayapple Borer Moth

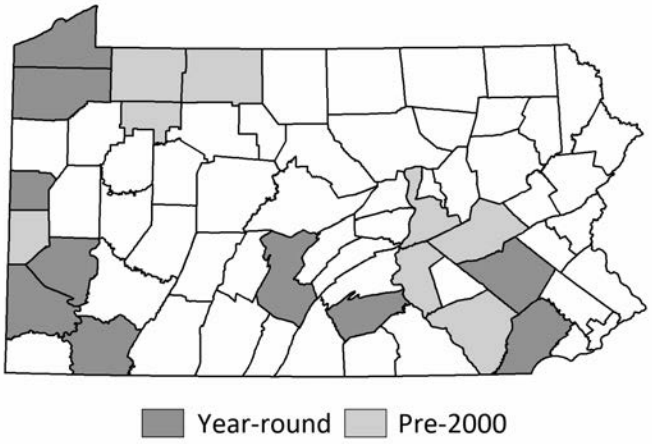
Papaipema rutila

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Hardwood forests and mesic woodlands with abundant food plant, mayapple (Podophyllum peltatum).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Direct loss of habitat to development and habitat degradation including conversion of native vegetation to lawn and ornamentals and increased light pollution from outdoor lighting.

Action Category: Outreach, communication and distribution

Specific Action: Promote the protection and enhancement of native vegetation to support pollinators during development projects and in landscaping; promote best practices in outdoor lighting to minimize light pollution.

Objective: Communicate best practices for development with agencies, businesses, developers, municipalities, land owners, etc. Best practices should include strategies to minimize destruction or conversion of habitats that support native plants during site development, minimize conversion of native vegetation into lawn or paved areas, increase native species in plantings for landscaping and water infiltration areas, and control invasives so that native plants can thrive. Protect robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur. Share best practices for outdoor lighting to reduce artificial light pollution.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of new communication channels, partnerships, outreach events and educational materials developed to share information with target audiences.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: pollinators and other wildlife

No known research needs.

No known survey priorities.

No known monitoring programs.

Eisenbeis, G. 2006. Artificial night lighting and insects: attraction of insects to streetlights in a rural setting in Germany. Pp. 281-304 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

Frank, K. 2006. Effects of artifical night lighting on moths. Pp. 305-344 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

PENNSYLVANIA WILDLIFE ACTION PLAN

Flypoison Borer Moth

Papaipema amianthii

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Leppo

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G2G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Primarily acidic woodlands, forests and barrens with abundant host plant fly-poison (Amianthium muscaetoxicum).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Low

Specific Threat: Fire may help create and rejuvenate habitat, but as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Direct loss of habitat to development and habitat degradation including conversion of native vegetation to lawn and ornamentals and increased light pollution from outdoor lighting.

Action Category: Outreach, communication and distribution

Specific Action: Promote the protection and enhancement of native vegetation to support pollinators during development projects and in landscaping; promote best practices in outdoor lighting to minimize light pollution.

Objective: Communicate best practices for development with agencies, businesses, developers, municipalities, land owners, etc. Best practices should include strategies to minimize destruction or conversion of habitats that support native plants during site development, minimize conversion of native vegetation into lawn or paved areas, increase native species in plantings for landscaping and water infiltration areas, and control invasives so that native plants can thrive. Protect robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur. Share best practices for outdoor lighting to reduce artificial light pollution.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of new communication channels, partnerships, outreach events and educational materials developed to share information with target audiences.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: pollinators and other wildlife

No known research needs.

No known survey priorities.

No known monitoring programs.

Eisenbeis, G. 2006. Artificial night lighting and insects: attraction of insects to streetlights in a rural setting in Germany. Pp. 281-304 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

Frank, K. 2006. Effects of artifical night lighting on moths. Pp. 305-344 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ostrich Fern Borer Moth

Papaipema hesseli

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Requires large patches of host plant, ostrich fern (Matteucia struthiopteris), and most often found in floodplain forests, but also sometimes upland mesic deciduous forest.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Direct loss of habitat to development and habitat degradation including conversion of native vegetation to lawn and ornamentals and increased light pollution from outdoor lighting.

Action Category: Outreach, communication and distribution

Specific Action: Promote the protection and enhancement of native vegetation to support pollinators during development projects and in landscaping; promote best practices in outdoor lighting to minimize light pollution.

Objective: Communicate best practices for development with agencies, businesses, developers, municipalities, land owners, etc. Best practices should include strategies to minimize destruction or conversion of habitats that support native plants during site development, minimize conversion of native vegetation into lawn or paved areas, increase native species in plantings for landscaping and water infiltration areas, and control invasives so that native plants can thrive. Protect robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur. Share best practices for outdoor lighting to reduce artificial light pollution.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of new communication channels, partnerships, outreach events and educational materials developed to share information with target audiences.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Biological Survey, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus. Physiographic Section: Northwestern Glaciated Plateau, High Plateau, Glaciated High Plateau, Glaciated High Plateau, Glaciated High Plateau, Glaciated Low Plateau, Anthracite Valley, Glaciated Pocono Plateau, Deep Valleys, Glaciated High Plateau

Other species likely to benefit from this action: pollinators and other wildlife

No known research needs.

No known survey priorities.

No known monitoring programs.

Eisenbeis, G. 2006. Artificial night lighting and insects: attraction of insects to streetlights in a rural setting in Germany. Pp. 281-304 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

Frank, K. 2006. Effects of artifical night lighting on moths. Pp. 305-344 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

PENNSYLVANIA WILDLIFE ACTION PLAN

Masked Parahypenodes Moth

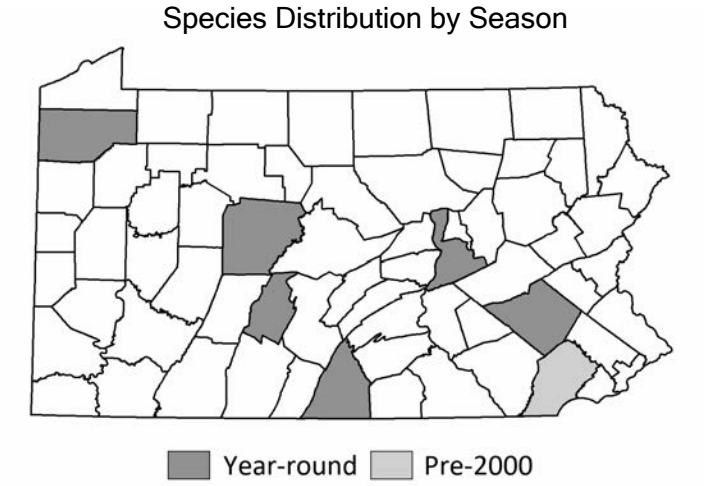
Parahypenodes quadralis

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



F. Jacobsen



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Mostly associated with dense swampy forest. May feed on algae or dead leaves.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Buffalo Moth

Parapamea buffaloensis

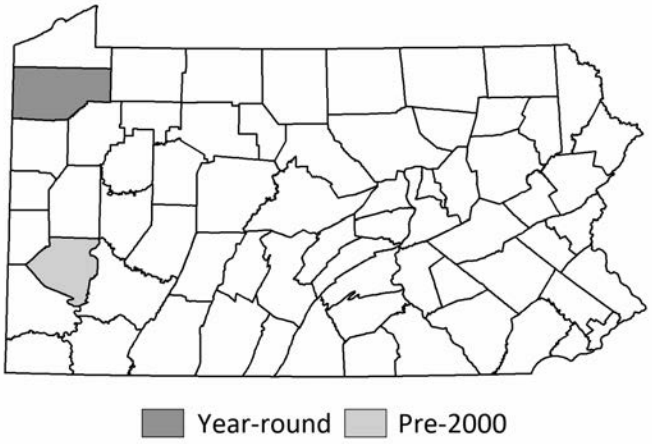
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: swamps and riparian areas, in association with lizard's tail (Saururus cernuus), the larval host plant.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Rich Swamp

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Conversion and/or succession of herbaceous wetlands, wet meadows, streamside meadows, etc. to other habitat types.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Uncommon Oak Moth

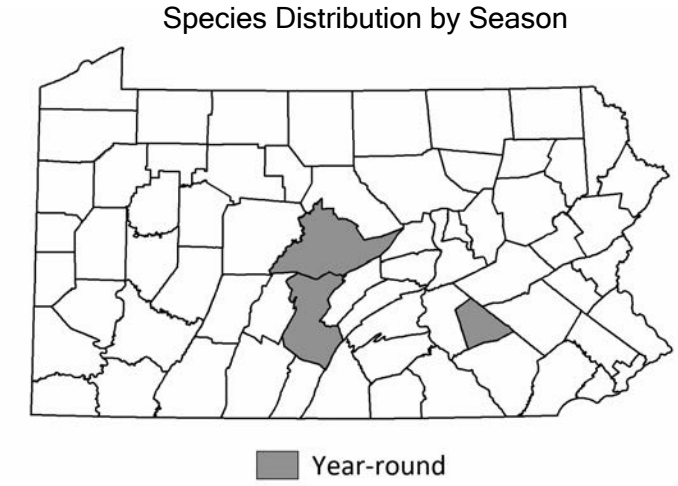
Phoberia ingenua

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Dry, sandy habitats with host plant, scrub oak (Quercus ilicifolia).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Purple Plagodis Moth

Plagodis kuetzingi

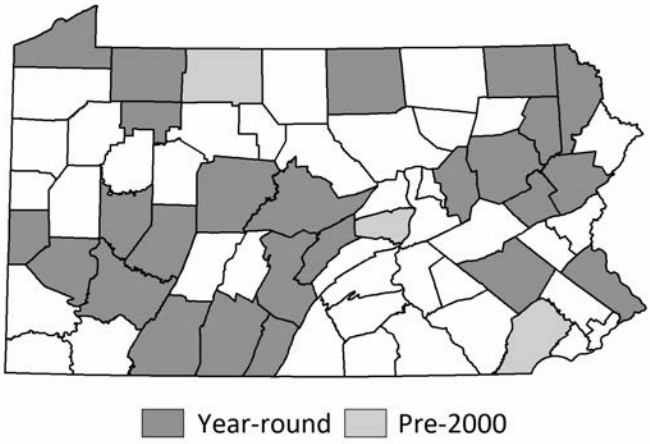
Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Walter

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Avoid the extirpation of the moth from PA.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >70%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specializes on ash trees (Fraxinus spp.).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. P. keutzingi is still extant, probably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ash Borer Moth

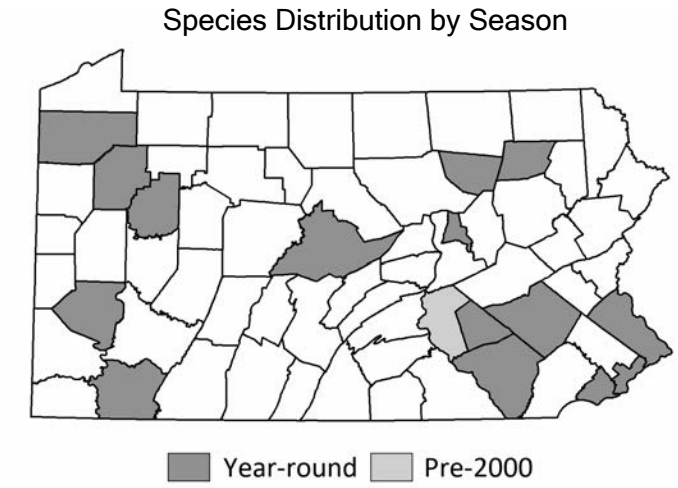
Podosesia syringae

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Lehman



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the moth from Pennsylvania

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Woodlands and forests with ash trees (Fraxinus); caterpillars live inside branches and feed on the ash wood.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. P. syringae is still extant, probably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Barrens Moth

Properigea costa

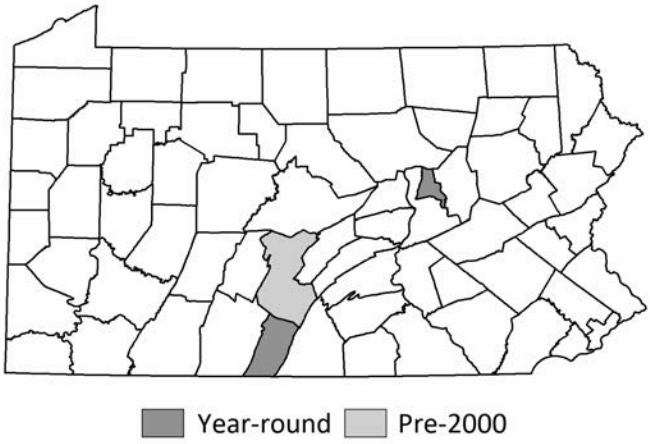
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Sandy, dry, and rocky woodlands, thickets, and barrens.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Pesticide treatments to control spongy moths is a threat.

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pink Sallow Moth

Psectraglaea carnosa

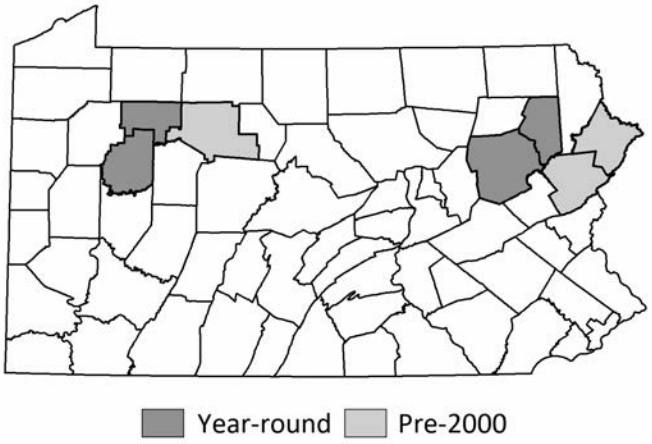
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Dry to mesic pine and oak barrens, with a high density of the host plants, low-growing oaks (Quercus), blueberries (Vaccinium), and Rosaceae. In some localities (such as Buzzard Swamp), it is associated with blueberry in wetlands.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Plain Schizura Moth

Coelodasys apicalis

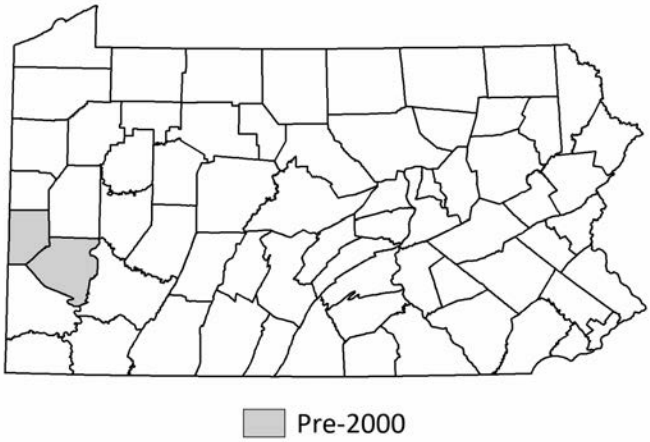
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Sandy, open woodlands or scrub, often along the shores of lakes. Host plants include blueberry (Vaccinium), willow (Salix), and possibly shrubby wild plums (Prunus).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: High - Medium

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Maroonwing Moth

Sideridis maryx

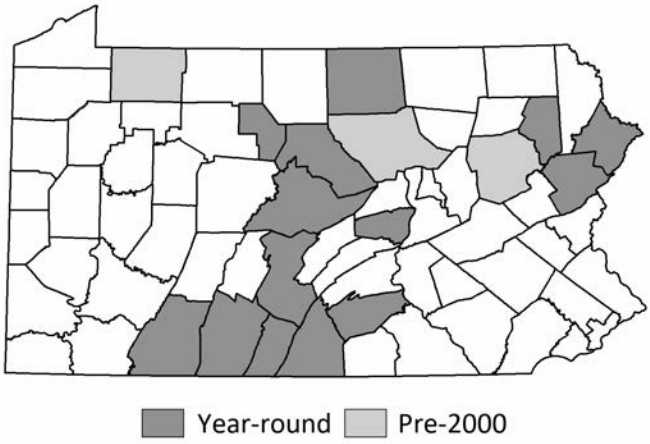
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Dry woodlands, sandy pine forest. Likely specializes on a single host plant, as yet unknown.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Medium

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Great Ash Sphinx Moth

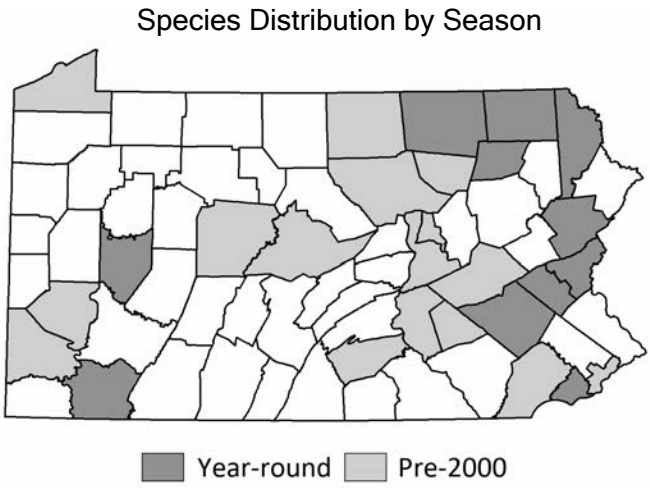
Sphinx chersis

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal: Avoid the extirpation of this moth from Pennsylvania

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >90%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specializes on ash trees (Fraxinus spp.). Occasionally also privet (Ligustrum).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, persisting either on ash saplings or introduced species of Oleraceae. Despite being common, these resources have not prevented the apparent severe range contraction of the moth.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Franck's Sphinx Moth

Sphinx franckii

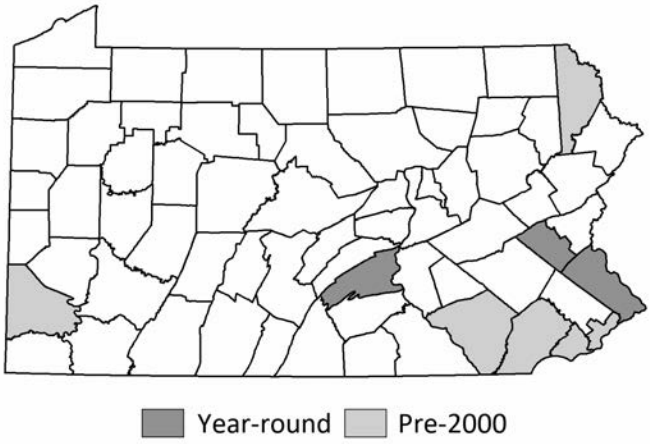
Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the moth from Pennsylvania.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-90%

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: Specializes on white ash trees (Fraxinus americana), and possibly other species of ash. Has also been reported from privet (Ligustrum).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Not clear if extant populations are persisting on Fraxinus saplings (a dwindling finite resource, high to very high threat) or introduced Oleraceae (lower threat).

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Shiny Gray Carpet Moth

Stamnodes gibbicostata

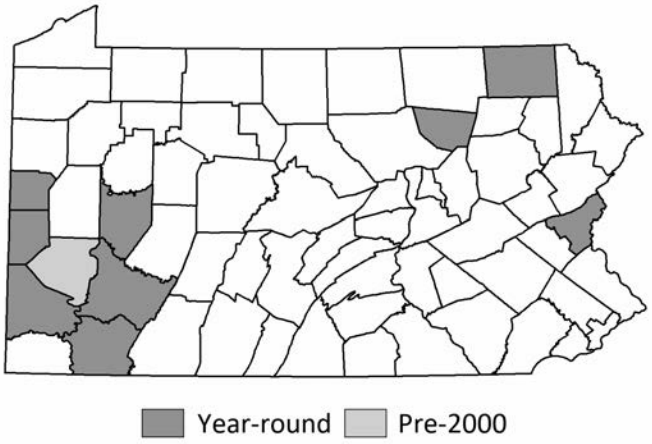
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Moist woods, thickets, and stream banks. Host plant is Eastern waterleaf (Hydrophyllum virginianum).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: South-Central Interior Mesophytic Forest

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: White-tailed deer browse on caterpillar food plants.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Gold-spotted Ghost Moth

Sthenopis pretiosus

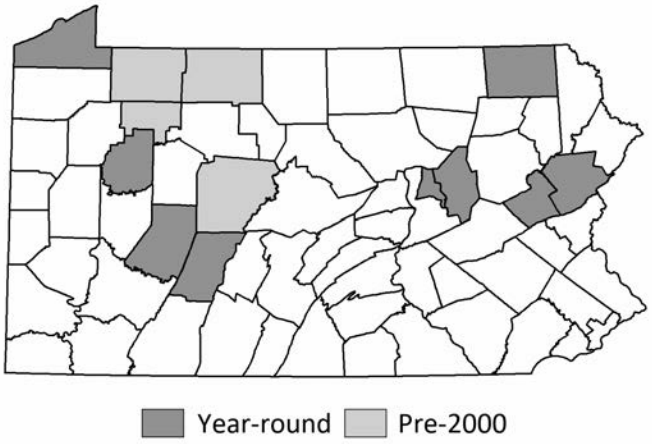
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



T. DeSantis

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Relatively stable (<=10% change)

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Mesic floodplains with ostrich fern, and sometimes other ferns, including Dryopteris marginalis, Dryopteris spinulosa, and Athyrium filix-femina

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: North-Central Appalachian Large River Floodplain

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Medium - Low

Specific Threat: Species is largely restricted to the Appalachian Mountains from Pennsylvania south, and becomes more widely distributed to the north of Pennsylvania, though still restricted to northeast US and into southeastern Canada.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Private Sallow Moth

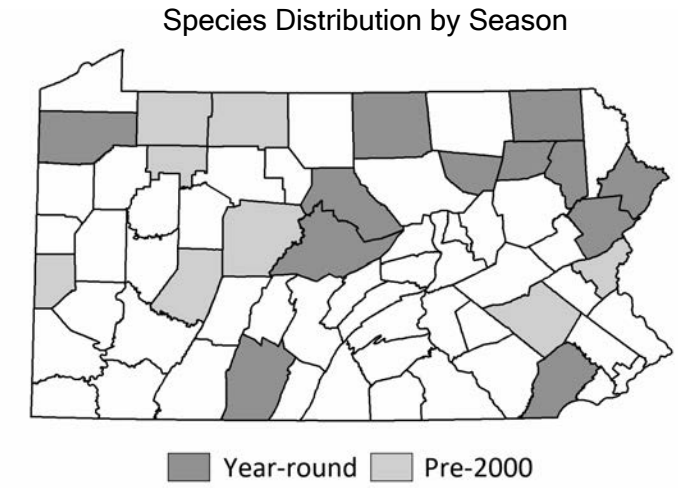
Sutyna privata

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Walewski



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Wet places in mixed forests and scrublands. Host plant is blackberry (Rubus).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Direct loss of habitat to development and habitat degradation including conversion of native vegetation to lawn and ornamentals and increased light pollution from outdoor lighting.

Action Category: Outreach, communication and distribution

Specific Action: Promote the protection and enhancement of native vegetation to support pollinators during development projects and in landscaping; promote best practices in outdoor lighting to minimize light pollution.

Objective: Communicate best practices for development with agencies, businesses, developers, municipalities, land owners, etc. Best practices should include strategies to minimize destruction or conversion of habitats that support native plants during site development, minimize conversion of native vegetation into lawn or paved areas, increase native species in plantings for landscaping and water infiltration areas, and control invasives so that native plants can thrive. Protect robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur. Share best practices for outdoor lighting to reduce artificial light pollution.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of new communication channels, partnerships, outreach events and educational materials developed to share information with target audiences.

Potential Collaborators: U.S. Fish and Wildlife Service, Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: pollinators and other wildlife

No known research needs.

No known survey priorities.

No known monitoring programs.

Eisenbeis, G. 2006. Artificial night lighting and insects: attraction of insects to streetlights in a rural setting in Germany. Pp. 281-304 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

Frank, K. 2006. Effects of artifical night lighting on moths. Pp. 305-344 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

PENNSYLVANIA WILDLIFE ACTION PLAN

Toothed Apharetra Moth

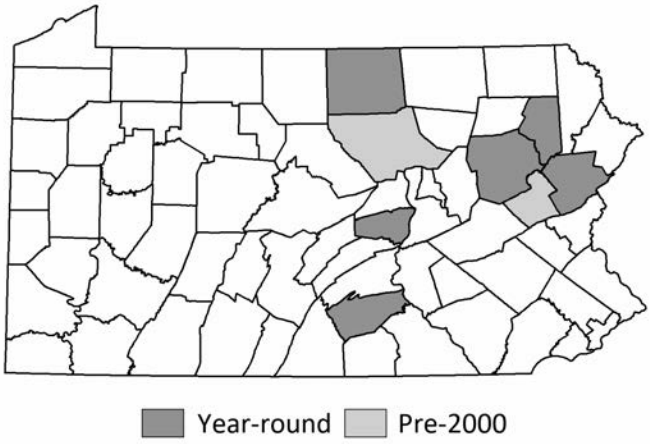
Sympistis dentata

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Pine barrens, heathlands, and bogs, where host plant, blueberries (Vaccinium) are found.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: Medium - Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Epigaea Looper Moth

Syngrapha epigaea

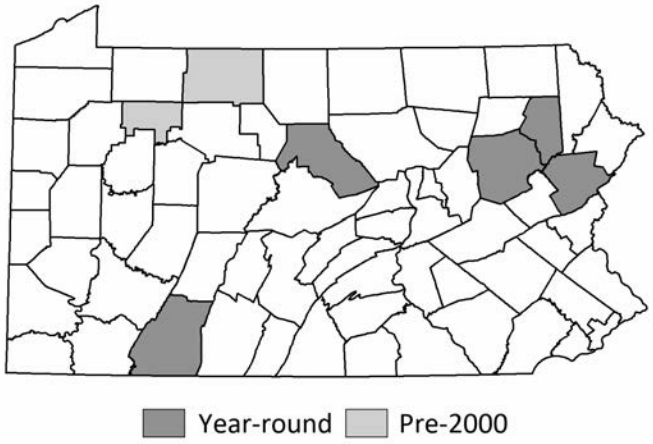
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



benjesup

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Dry rocky or sandy habitats, and also bogs. Feeds primarily on blueberry (Vaccinium) and laurel (Kalmia).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Loss of suitable habitat in Pennsylvania due to climate change

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Small Tolype Moth

Tolype notialis

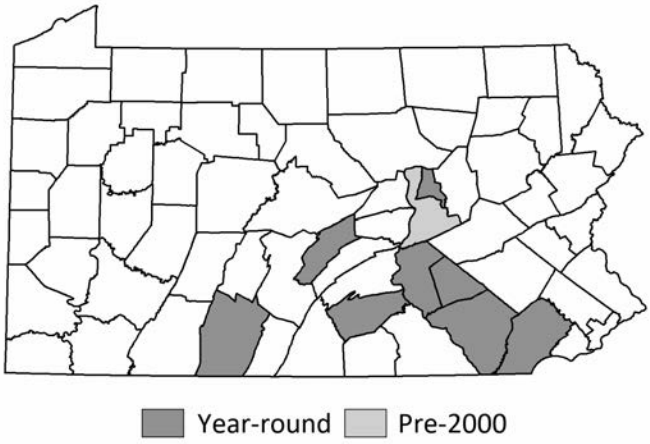
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



thesoulflowers

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Pine forests and barrens. Host plant a variety of conifers.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Joyful Holomelina Moth

Virbia laeta

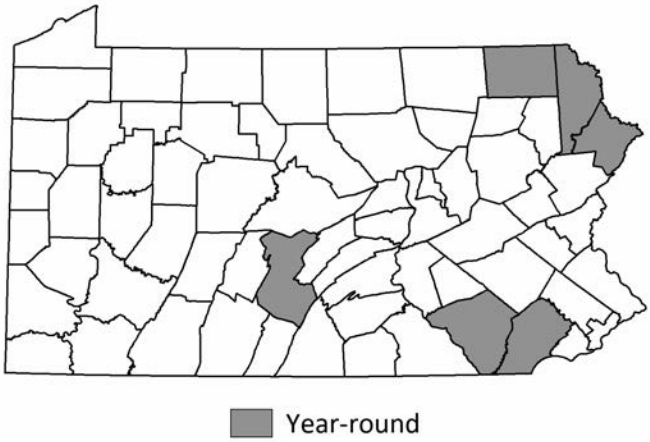
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Doe

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Dry, grassy habitat patches, often networks of small openings in woodlands. Has been observed to feed on dandelion (Taraxacum) and plantain (Plantago).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Low

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

The Yankee Dart Moth

Abagrotis brunneipennis

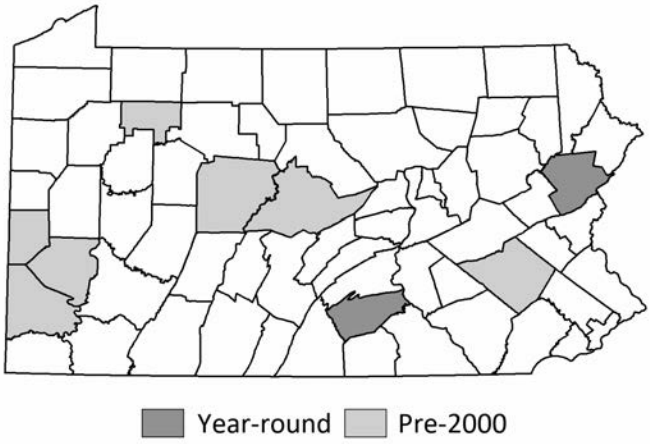
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Dry and often sandy heathlands, host plant is primarily blueberry (Vaccinium).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Waved Sphinx Moth

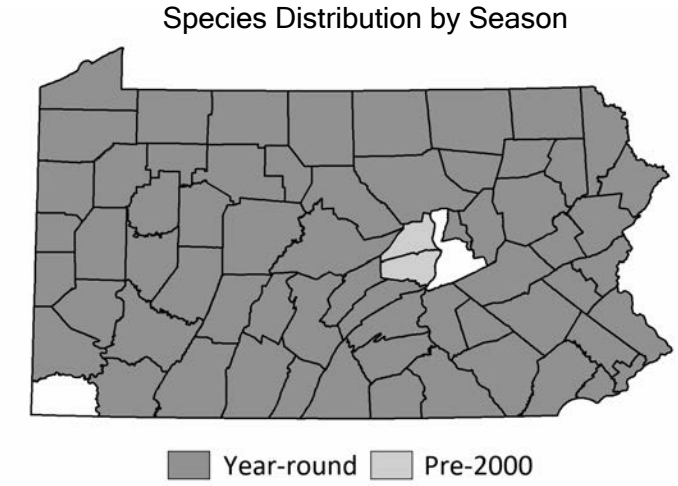
Ceratomia undulosa

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal: Avoid the extirpation of the moth from PA.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >70%

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Any forest with ash trees; upland or palustrine; not the northern acidic types.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, probably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Low Down Ash Bark-miner Moth

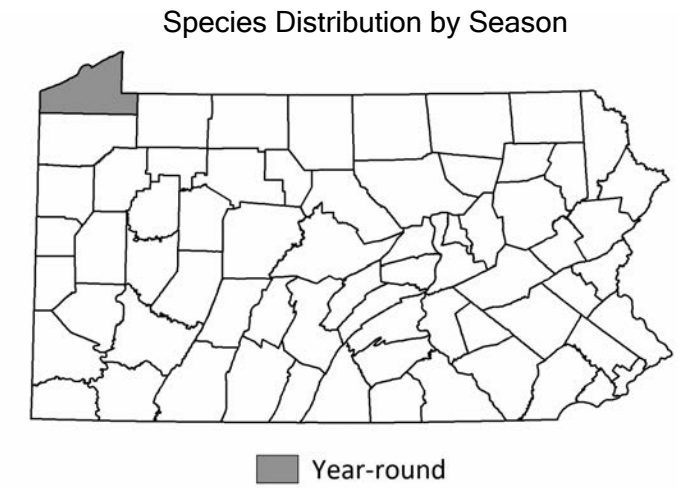
Marmara basidendroca

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal: Avoid the extirpation of the species

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 10-30%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Requires Fraxinus pennsylvanica (green ash) saplings.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA, so the ash seed bank is mostly gone now, and the saplings that this moth depends on will not be replaced as they mature or die. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years. Unlike other insect specialists of Fraxinus, Marmara spp. might be able to persist where mature ash trees are being treated with insecticide, especially if the treatment is injection rather than drench. Treated trees still produce seeds and seedlings, while the moth presumably does not use the mature trees (being reliant on the long internodes and thin bark of saplings).

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Physiographic Province: Appalachian Plateaus

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ash Bark-miner Moth

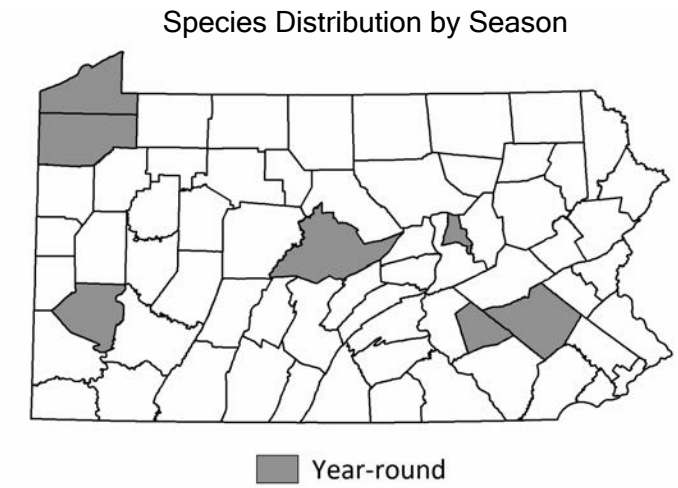
Marmara fraxinicola

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal: Prevent the moth from becoming extirpated from Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 10-30%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Requires Fraxinus pennsylvanica (green ash) or F. americana (white ash) saplings.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA, so the ash seed bank is mostly gone now, and the saplings that this moth depends on will not be replaced as they mature or die. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years. Unlike other insect specialists of Fraxinus, Marmara spp. might be able to persist where mature ash trees are being treated with insecticide, especially if the treatment is injection rather than drench. Treated trees still produce seeds and seedlings, while the moth presumably does not use the mature trees (being reliant on the long internodes and thin bark of saplings).

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Banded Ash Clearwing Moth

Podosesia aureocincta

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >70%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Forest with green ash (Fraxinus pennsylvanica) or white ash (F. americana).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. P. aureocincta is still extant, probably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Laurel Sphinx Moth

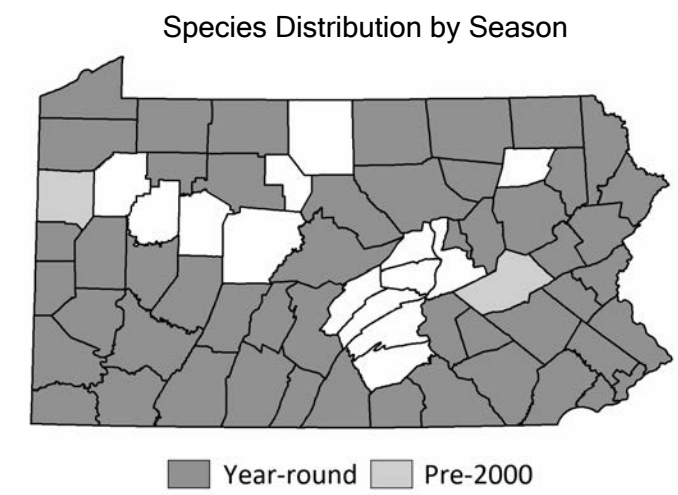
Sphinx kalmiae

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal: Avoid the extirpation of this moth from PA.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 50-80%

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: The host plants are ash trees (Fraxinus spp.). Has also been recorded from fringetree (Chionanthus virginica), privet (Ligustrum), and lilac (Syringa).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Ash saplings are a finite and dwindling resource at this point, and the ability of introduced Oleraceae to support populations of the moth has not been proven.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Small Brocade Moth

Oligia minuscula

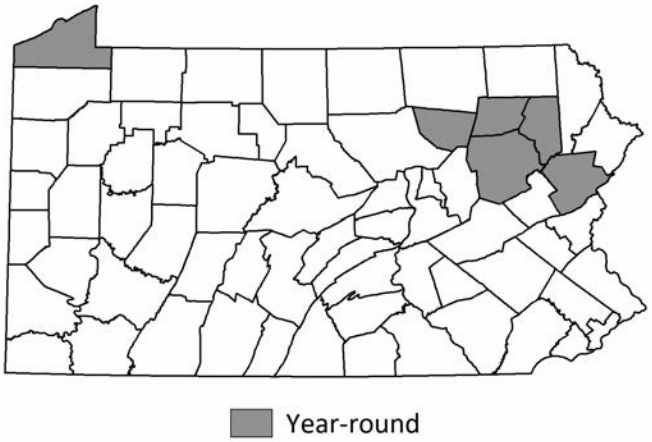
Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Sphagnum bogs

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Medium - Low

Specific Threat: Nitrogen input into bogs from the surrounding watershed, whether from agriculture, septic systems, or other sources, degrades the peat substrate of bogs.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement.

Objective: Identify and prioritize bogs for protections. Pursue protection options at high priority sites.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts

Locations: Physiographic Section: Northwestern Glaciated Plateau, Glaciated Low Plateau, Glaciated High Plateau, Anthracite Valley, Glaciated Pocono Plateau

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris) Darlington's Harp Ground Beetle (Agonum darlingtoni)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A geometrid moth

Orthofidonia exornata

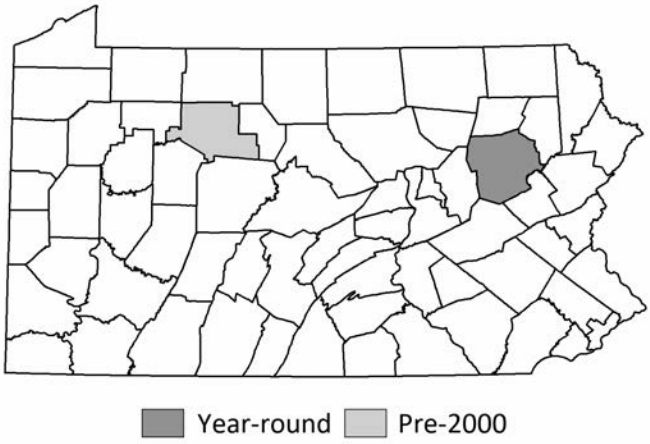
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: upland forest with Viburnum

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Loss of suitable habitat in Pennsylvania due to climate change.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 4-Low

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Columbine Borer Moth

Papaipema leucostigma

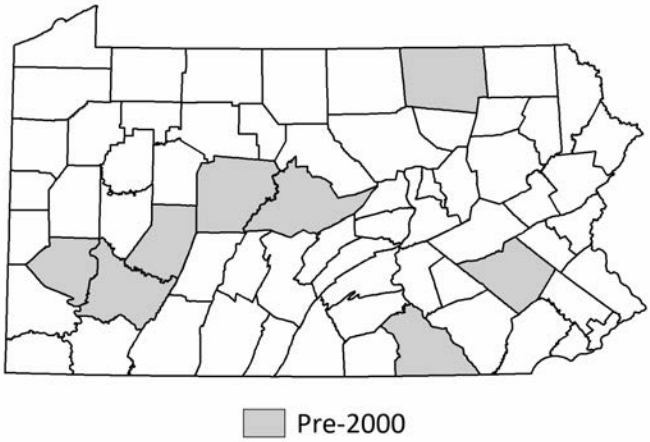
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Nelson

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Outcrops and other rocky places with limestone, where wild columbine (Aquilegia canadensis) grows.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: Medium - Low

Specific Threat: Loss of suitable habitat in Pennsylvania due to climate change.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 4-Low

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pearly Indigo Borer

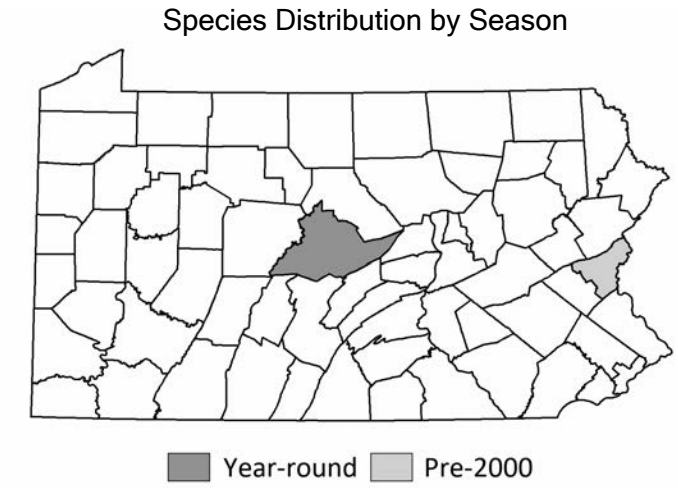
Sitochroa dasconalis

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of this species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Grassy openings with sandy or rocky soils, most commonly now in anthropogenic habitats such as powerline and railroad right-of-ways. Host plant is Baptisia (Baptisia tinctoria).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Utility and Service Lines

Threat Impact: High - Low

Specific Threat: Rights-of-way are important habitats for the host plant (Yellow Wild Indigo, Baptisia tinctoris), which is vulnerable to ROW management practices such as indiscriminant herbicide spraying.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** High - Low

Specific Threat: Rights-of-way are important habitats for the host plant (Yellow Wild Indigo, Baptisia tinctoris), which is vulnerable to ROW management practices such as indiscriminant herbicide spraying.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Mowing is the preferred method for maintaining low vegetation on right-of-ways, and is least disruptive to wildlife when conducted between late fall and early spring. Best practices include managing habitats on a rotational basis, and disturbing less than a quarter of core open habitats in a year (provides refuge in unmanaged habitat). Allow shrubs and small trees to feather the edges between right-of-ways and the adjacent forest. Within right-of-ways, encourage patches of native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc. Herbicides may be needed to control resprouting trees and invasive plants.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** High - Low

Specific Threat: Rights-of-way are important habitats for the host plant (Yellow Wild Indigo, Baptisia tinctoris), which is vulnerable to ROW management practices such as indiscriminant herbicide spraying.

Action Category: Outreach, communication and distribution

Specific Action: Work with electric and gas ROW managers, and with landowners, to protect populations of New Jersey Tea (Ceanothus americanus), Wild Indigo (Baptisia tinctoria), and Sundial Lupine (Lupinus perennis) that are vulnerable to ROW management practices.

Objective: Identify populations of these plants on ROWs, and prioritize populations of each species by population size/area and by known presence of target invertebrate specialist species. Get landowners and managers to agree on management plans for each site.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of plans written.

Potential Collaborators: Businesses, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on Yellow Wild Indigo and would benefit from this action: Baptisia Seedpod Weevil (Apion rostrum), A leafminer fly (Liriomyza baptisiae), A lace bug (Leptopharsa heidemanni), Lupine Leafroller Moth (Anacampsis lupinella), Three-lined Grapholita (Grapholita tristrigana), A pyralid moth (Pococera baptisiella), Pearly Indigo Borer (Sitochroa dasconalis), Genista Broom Moth (Uresiphita reversalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Eastern Phacelia Flower Moth

Tinagma gaedikei

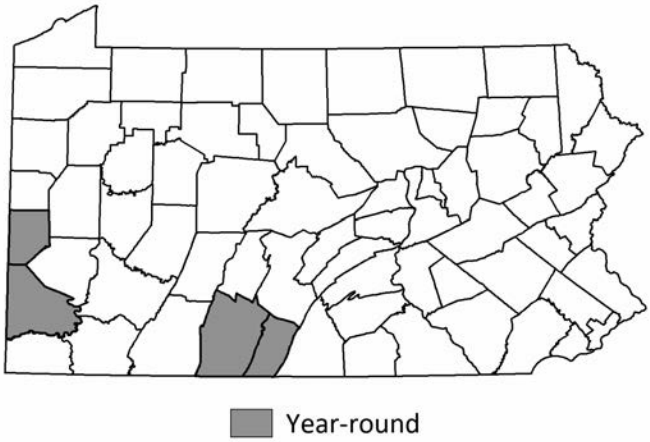
Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: The host Appalachian Phacelia (Phacelia dubia) occurs on shale barrens, and outcrops along the Susquehanna River. The other host, Miami mist (Phacelia purshii) occurs in mesic to submesic deciduous forests.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: South-Central Interior Mesophytic Forest

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plants of this specialist moth are particularly susceptible to invasive plants, which crowd the host plant out of its habitat. While the host plants may not be catastrophically impacted in the next ten years, but a slow and steady decline of host plants is expected in the absence of action.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Identify sites where Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) occur on state lands. Evaluate those sites for invasive plants, and use herbicide to control the plants in cases where they threaten the Phacelia species.

Objective: Evaluate 9 populations of Phacelia spp. on state lands, and actively manage all that are threatened by invasive plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Percent control of invasive species achieved at each site

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Universities & research institutions

Locations: Physiographic Section: Waynesburg Hills, Allegheny Mountain, Allegheny Front, Appalachian Mountain, Great Valley, South Mountain, Gettysburg-Newark Lowland, Piedmont Upland

Other species likely to benefit from this action: The six SGCN that use Phacelia spp. would benefit; this includes 3 bees: Andrena phaceliae, Andrena lamelliterga, and Hoplitis simplex; and 3 moths: Tinagma gaedikei, Ethmia zelleriella, and Ethmia macelhosiella. Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) would also benefit.

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plants of this specialist moth are particularly susceptible to invasive plants, which crowd the host plant out of its habitat. While the host plants may not be catastrophically impacted in the next ten years, but a slow and steady decline of host plants is expected in the absence of action.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Determine which populations of Phacelia spp. support which of the 6 specialist insects. Most of those insects can be surveyed while the host plants are in bloom (mid- to late May). The moth Ethmia macelhosiella may require a black light survey in October/November. Surveys could be performed by the PA Bee Monitoring Project, WPC, or other qualified individuals.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Genista Broom Moth

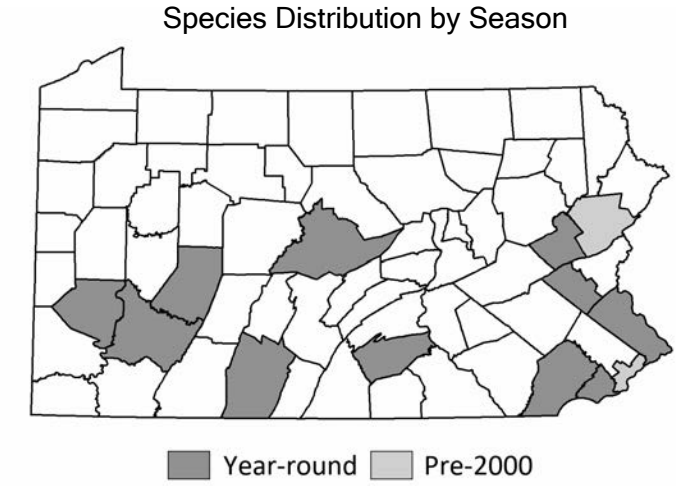
Uresiphita reversalis

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



personablebird



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and improve our knowledge of the species' distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Grassy openings with sandy or rocky soils, most commonly now in anthropogenic habitats such as powerline and railroad right-of-ways. Host plant is Baptisia (Baptisia tinctoria).

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Utility and Service Lines

Threat Impact: High - Low

Specific Threat: Rights-of-way are important habitats for the host plant (Yellow Wild Indigo, Baptisia tinctoris), which is vulnerable to ROW management practices such as indiscriminant herbicide spraying.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** High - Low

Specific Threat: Rights-of-way are important habitats for the host plant (Yellow Wild Indigo, Baptisia tinctoris), which is vulnerable to ROW management practices such as indiscriminant herbicide spraying.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Mowing is the preferred method for maintaining low vegetation on right-of-ways, and is least disruptive to wildlife when conducted between late fall and early spring. Best practices include managing habitats on a rotational basis, and disturbing less than a quarter of core open habitats in a year (provides refuge in unmanaged habitat). Allow shrubs and small trees to feather the edges between right-of-ways and the adjacent forest. Within right-of-ways, encourage patches of native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc. Herbicides may be needed to control resprouting trees and invasive plants.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** High - Low

Specific Threat: Rights-of-way are important habitats for the host plant (Yellow Wild Indigo, Baptisia tinctoris), which is vulnerable to ROW management practices such as indiscriminant herbicide spraying.

Action Category: Outreach, communication and distribution

Specific Action: Work with electric and gas ROW managers, and with landowners, to protect populations of New Jersey Tea (Ceanothus americanus), Wild Indigo (Baptisia tinctoria), and Sundial Lupine (Lupinus perennis) that are vulnerable to ROW management practices.

Objective: Identify populations of these plants on ROWs, and prioritize populations of each species by population size/area and by known presence of target invertebrate specialist species. Get landowners and managers to agree on management plans for each site.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of plans written.

Potential Collaborators: Businesses, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on Yellow Wild Indigo and would benefit from this action: Baptisia Seedpod Weevil (Apion rostrum), A leafminer fly (Liriomyza baptisiae), A lace bug (Leptopharsa heidemanni), Lupine Leafroller Moth (Anacampsis lupinella), Three-lined Grapholita (Grapholita tristrigana), A pyralid moth (Pococera baptisiella), Pearly Indigo Borer (Sitochroa dasconalis), Genista Broom Moth (Uresiphita reversalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Oval Abrostola Moth

Abrostola ovalis

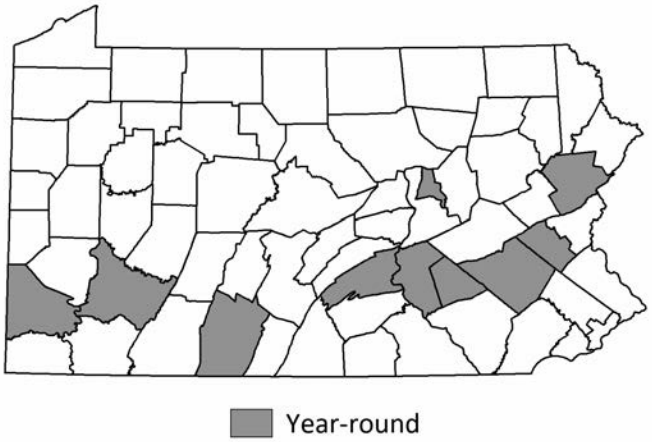
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Very High

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forests and riparian areas with nettles (including Urtica spp.) and hog peanut (Amphicarpa bracteata)

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive species around large populations of nettles (genus Urtica or Laportea) through hand pulling and other mechanical methods.

Objective: Maintain low levels of invasive plants in the understories of rich hardwood forests that support large stands of nettles.

Action Priority: 4-Low **Action Urgency:** Initiate within 5-10 years **Measure:** Area of habitat restored

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: New England, Ridge and Valley, Appalachian Plateaus

Other species likely to benefit from this action:

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Olive and Black Carpet Moth

Acasis viridata

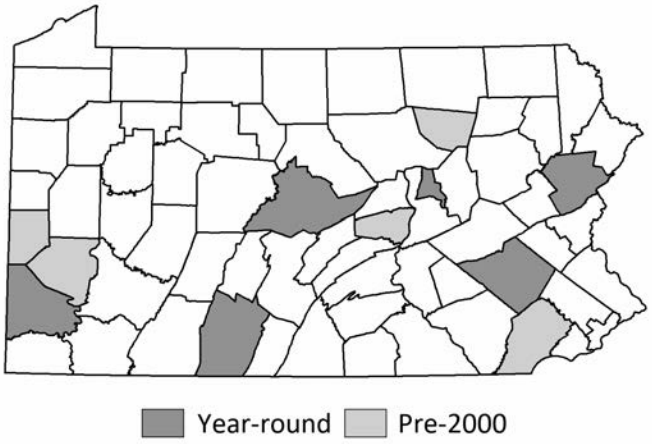
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Caterpillars feed on Virburnumns, especially Possumhaw (Viburnum cassinoides).

Primary Habitat: Forested Upland

Primary Habitat Type: High Elevation Forests

Primary Specific Habitat: Appalachian (Hemlock)-Northern Hardwood Forest

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Climate change is expected to reduce suitability of some habitats in Pennsylvania.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate change mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate change mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A tortricid moth

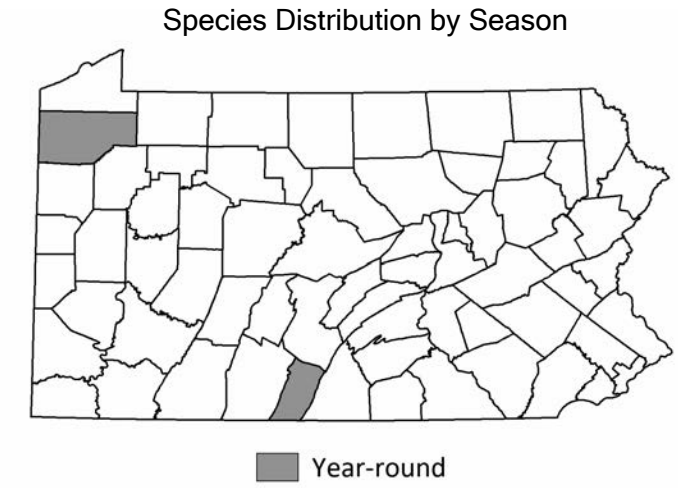
Acleris oxycoccana

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Gordon



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Species may be associated with wetland or barrens habitats (including shale barrens) with its foodplants which include small cranberry, leatherleaf, and sand cherry (Prunus pumila).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Blueberry Budworm Moth

Abagrotis anchocelioides

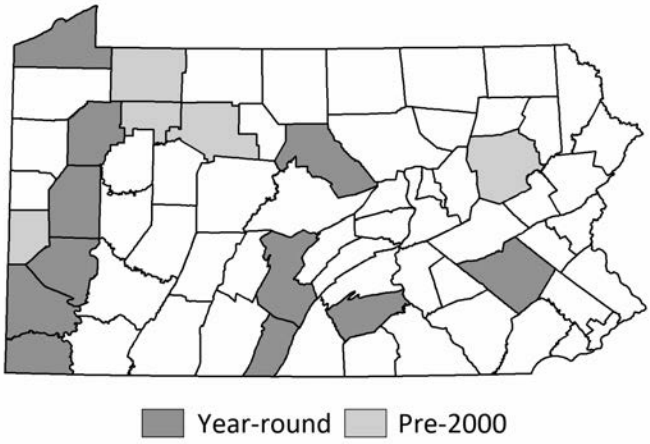
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Very High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Caterpillars may feed the fruit buds of blueberry (Vaccinium sp.)

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Corylus Dagger Moth

Acronicta falcula

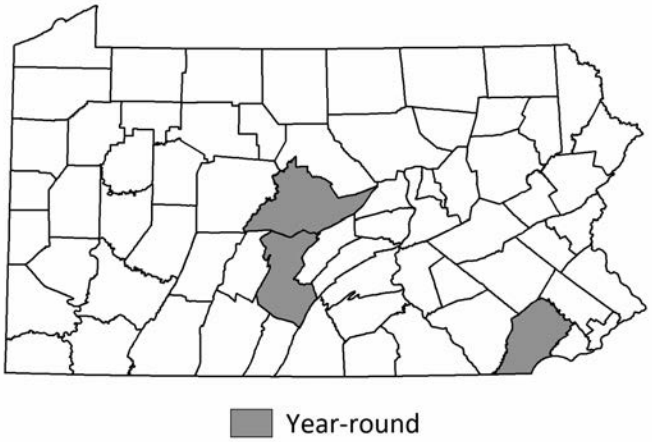
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G2G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: The caterpillars feed on hazel hostplants (Corylus) and need large stands of the food plant. The species also seems to be associated with barrens habitats in Pennsylvania.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Hazel (Corylus) is a primarily host plant for the caterpillars of the corylus dagger moth (Acronicta falcula), and of another rare moth, the straight lined mallow moth (Bagisara rectifascia). Many other more generalist-feeding lepidoptera include hazel in their diets. Hazel is a valuable food and shelter resource for many birds and mammals.

No known research needs.

No known survey priorities.

No known monitoring programs.

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Tremblay, J-P., S.D. Cote, T. Rooney, and C. Dussault. 2014. Ecological impacts of deer overabundance on temperate and boreal forests. Article in Annual Review of Ecology Evolution and Systematics. 35:113-47. DOI:10.1146/annurev.ecolsys.35.021103.105725.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pointed Dagger Moth

Acronicta lanceolaria

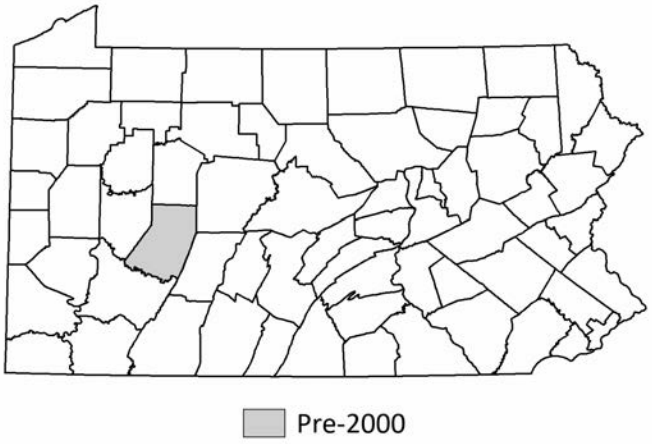
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year:

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Acronicta lanceolaria caterpillars feed on a wide variety of woody host plants, but is a habitat specialist associated with extensive heathlands and pine barrens. Sometimes associated with acidic shrublands of marshes and peatlands.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** High - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Hopeful Dagger Moth

Acronicta sperata

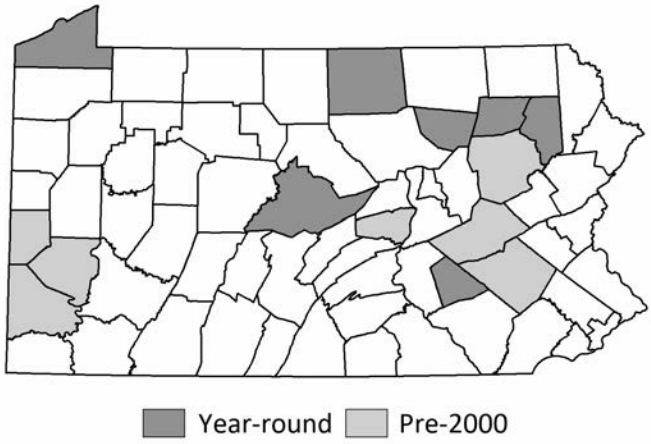
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



T. Murray

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: A northern species of woodlands and riparian areas with abundant caterpillar host plant, primarily aspen (Populus) but also documented on willows (Salix) and alder (Alnus).

Primary Habitat: Forested Upland

Primary Habitat Type: High Elevation Forests

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Pennsylvania is near the southern edge of range for this species; it is associated with cooler climates and higher elevation forests.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Roseate Grass Moth

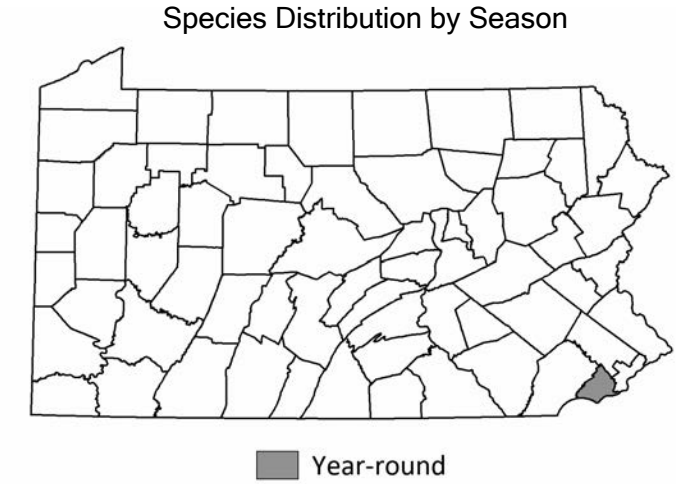
Amolita roseola

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



L. Gaudette



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: In Pennsylvania, Amolita roseola is associated with barrens habitats in Pennsylvania. Host plant is Carex pensylvania, with other species of Carex likely used.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Dappled Dart Moth

Anaplectoides pressus

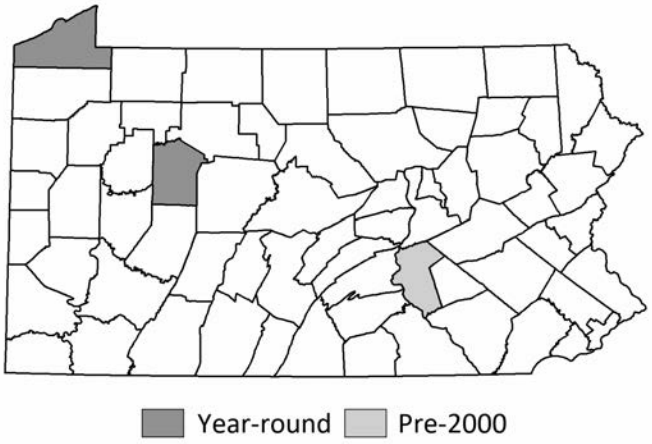
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: This species is adapted to cool, moist, and high elevation forested habitats. Suitable climate in Pennsylvania is limited. Caterpillars are generalists feeding on a variety of hardwood trees and some herbaceous plants.

Primary Habitat: Forested Upland

Primary Habitat Type: High Elevation Forests

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: Medium - Low

Specific Threat: Pennsylvania is at the southern edge of the species' current known range in the eastern U.S. This is a more northern moth that utilizes cool, moist, and high elevation forested habitats. Its' range may be contracting to the north with climate change.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Puta Sallow Moth

Anathix puta

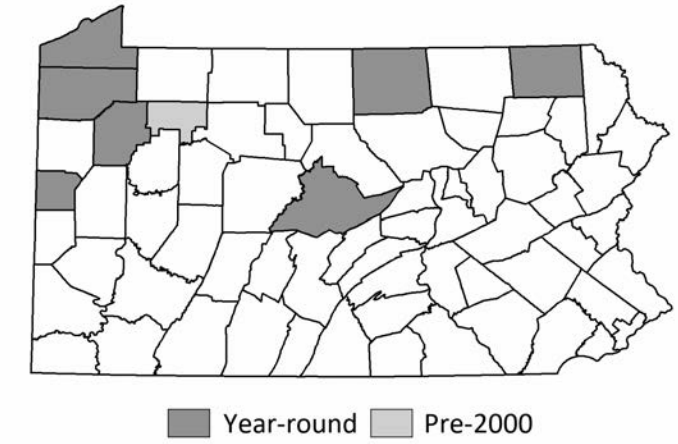
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Northern forests with abundant quaking aspen (Populus tremuloides), which is the caterpillar food plant.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

Conservation, management and stewardship of ridgetop barrens at Long Pond Barrens, Monroe County

PENNSYLVANIA WILDLIFE ACTION PLAN

White-edged Ancylis Moth

Ancylis albacostana

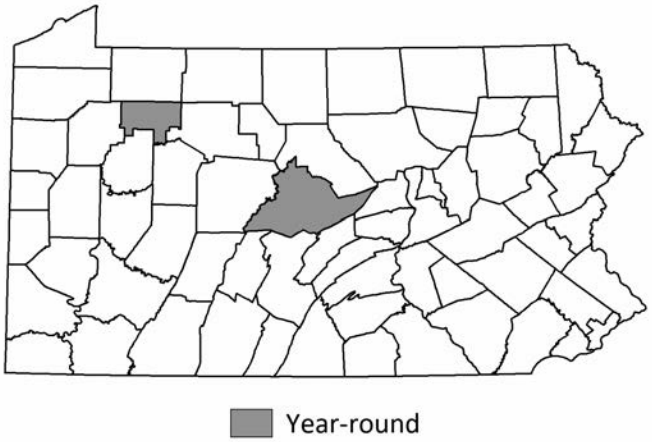
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Associated with colder forest habitats in Pennsylvania, reported host plants include maples (Acer) and sand cherry (Prunus pumila).

Primary Habitat: Forested Upland

Primary Habitat Type: High Elevation Forests

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A tortricid moth (Ceanothis feeder)

Ancylis semiovana

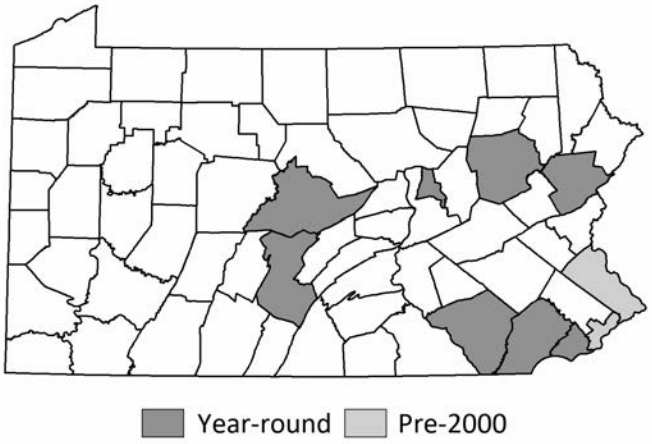
Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Barrens with New Jersey tea (Ceanothus americanus)

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Install deer fencing around those populations of New Jersey Tea that are known to support specialist herbivores. If data is lacking, assume that larger populations harbor at least one of the SGCN specialists.

Objective: Protect 10 populations of New Jersey Tea with deer exclosures

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number and area of exclosures built; change in area of New Jersey Tea colony

Potential Collaborators: Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulate) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: White-tailed deer browse on caterpillar food plants and adult nectar resources.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Medium

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Outreach, communication and distribution

Specific Action: Encourage communication and share information between wildlife biologists, landowners / land managers, and utility companies

Objective: Facilitate communication between landowner/ land manager and utility companies to coordinate and adapt activities to optimize habitat for SGCN species while protecting utility resources. Share information on best practices for habitat management on right-of-ways to benefit SGCN insects and other wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: Number of sites where communication with land owners / land managers and utility right-of-way companies result in surveys for SGCN species and for important resources that support them like host plants and specialized habitats. Number of surveys for potential threats like invasives and ongoing management issues. Number of sites with specific best practices developed to support SGCN species known or expected to occur in defined sections of right-of-ways. Number of management activities that are communicated with and reviewed by wildlife biologists to maximize benefits and minimize negative impacts to SGCN species. Number of management activities that are implemented with best practices in place to benefit SGCN species.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** Medium

Specific Threat: Management activities on rights-of-way that are conducted without regard for the species' life history and habitat needs.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain low vegetation height on right-of-ways for access and safety of powerline, pipeline, or transportation infrastructure; conduct activities in a manner that maximize benefits and minimize harms to the wildlife that utilize the early successional habitats found on right-of-ways.

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them. For example, protect low-growing native shrubs like scrub oak, blueberries and huckleberries, chokeberries, winterberries, steeplebush, etc.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Tall woody vegetation that is incompatible with right-of-way infrastructure and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys for the six New Jersey Tea specialist SGCN should be conducted where medium to large patches of New Jersey Tea are found. Presence of one of these species is evidence that the patch may be large and stable enough to support some of the other species.	Universities & research institutions

No known monitoring programs.

Lamprinos, Matthew J., "Impact of whitetail deer overpopulation with hunting on the decline" (2021). English Department: Research for Change - Wicked Problems in Our World. 52.
Available at https://research.library.kutztown.edu/wickedproblems/52 (accessed June 2025).

Natural Lands. What is the Most Dangerous Animal in Pennsylvania? Finding Balance. Available at https://www.natlands.org/news/finding-balance/ (accessed June 2025).

Pennsylvania Department of Conservation and Natural Resources. Conserving Forests and Native Plants through Deer Management. Available at https://www.pa.gov/agencies/dcnr/conservation/wildlife-biodiversity/biodiversity-managament/deer-management.html (accessed June 2025).

Pennsylvania Game Commission. Discover PA Wildlife - White-tailed Deer. Available at https://www.pa.gov/agencies/pgc/wildlife/discover-pa-wildlife/white-tailed-deer.html (accessed June 2025).

Tremblay, J-P., S.D. Cote, T. Rooney, and C. Dussault. 2014. Ecological impacts of deer overabundance on temperate and boreal forests. Article in Annual Review of Ecology Evolution and Systematics. 35:113-47. DOI:10.1146/annurev.ecolsys.35.021103.105725.

PENNSYLVANIA WILDLIFE ACTION PLAN

A dart moth

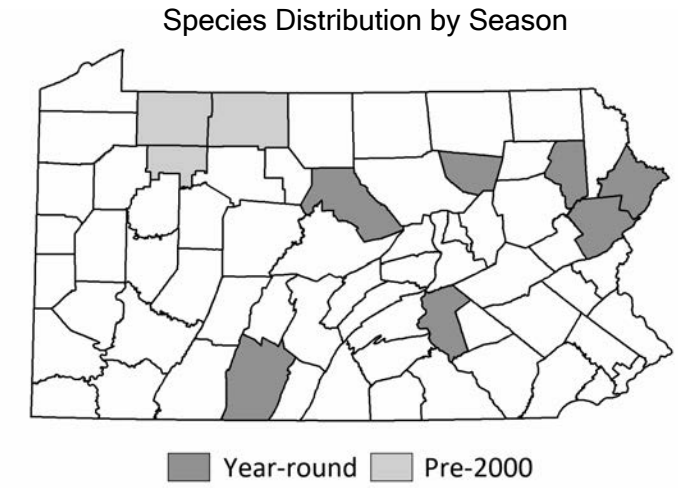
Anicla forbesi

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: NatureServe includes this species in the sand prairie, savanna, and barrens openings moth group. This Specs Group was conceived largely for certain eastern and central North American apameine and noctuine Noctuidae and a few Arctiidae characteristic of sand prairies westward and xeric, usually sandy, pine savannas or grassy openings in pine barrens eastward. Since they are apparently or definitely grass or herb feeders they probably do not fit well in the pine barrens moth group where most were originally placed.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Anicla forbesi ranges south of PA especially at higher elevations, but records are sparse and scattered south of us, while the bulk of records come from New England to east of us, and around the Great Lakes to the north of us.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

Survey Priorities

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Poplar Carpenterworm Moth

Acossus centerensis

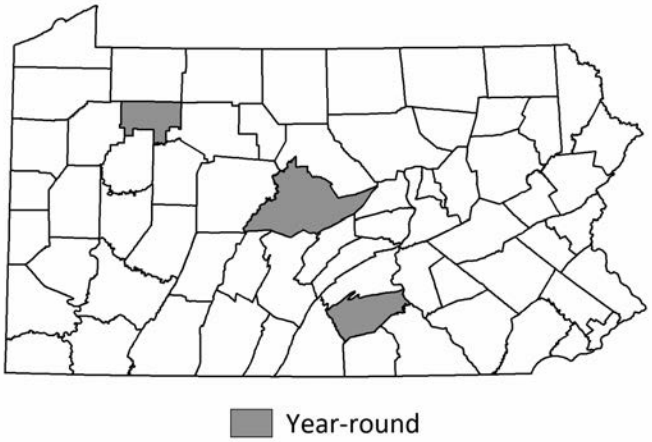
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forests and woodlands with aspens (Populus spp.).

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ignorant Apamea Moth

Apamea indocilis

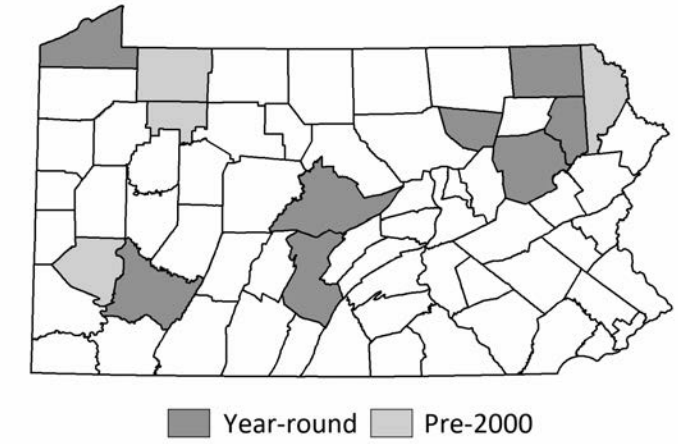
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



N. Block

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: This species is associated with cooler climates and higher elevation forests throughout its range.

Primary Habitat: Forested Upland

Primary Habitat Type: High Elevation Forests

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Loss of suitable habitat in Pennsylvania due to climate change.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Great Tiger Moth

Arctia caja

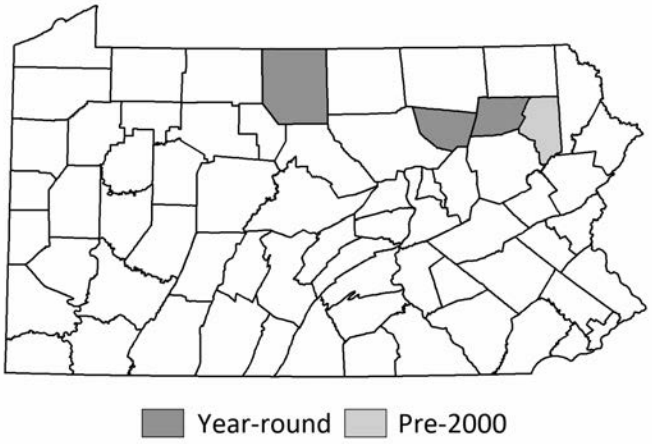
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Associated with cooler climates and higher elevation forests. Caterpillars are generalists that feed on a wide range of herbaceous and woody plants.

Primary Habitat: Forested Upland

Primary Habitat Type: High Elevation Forests

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Pennsylvania is near the southern edge of range for this species; it is associated with cooler climates and higher elevation forests.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

Conrad K.F., I.P. Woiwod, and J.N. Perry. 2002. Long-term decline in abundance and distribution of the garden tiger moth (Arctia caja) in Great Britain. Biological Conservation, 106(3) 329-337.

PENNSYLVANIA WILDLIFE ACTION PLAN

A crambid snout moth

Argyria nummulalis

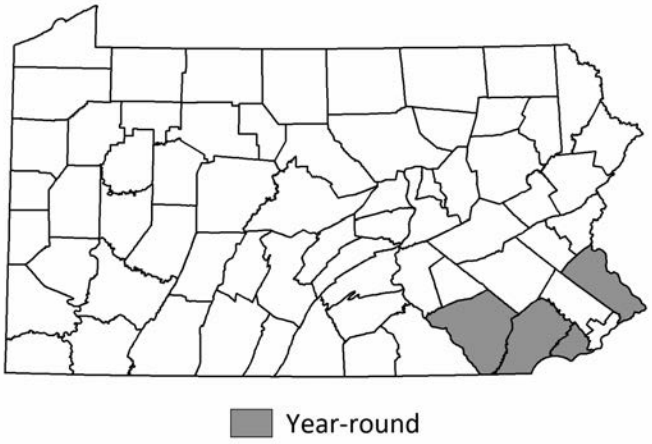
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Species is associated with grassland and wetlands, and particularly serpentine barrens grasslands in Pennsylvania. Host plant is grasses, but specific species not reported.

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Serpentine Barren / Woodland

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: High - Medium

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Four-lined Cream Moth

Cabera quadrifasciaria

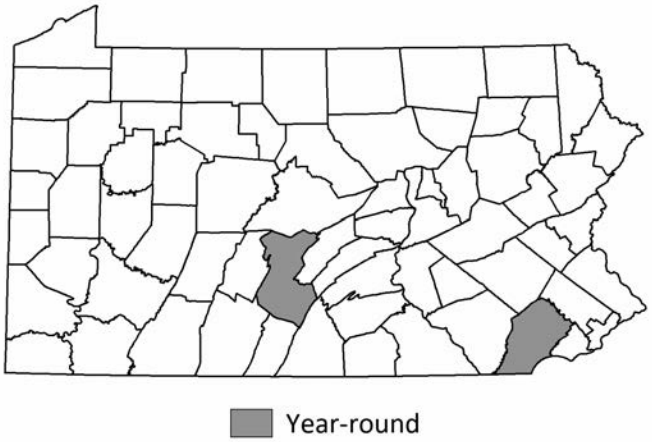
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Nirschl

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Riparian areas with false wild indigo (Amorpha fruticosa)

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: North-Central Appalachian Large River Floodplain

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Fish's Dart Moth

Cerastis fishii

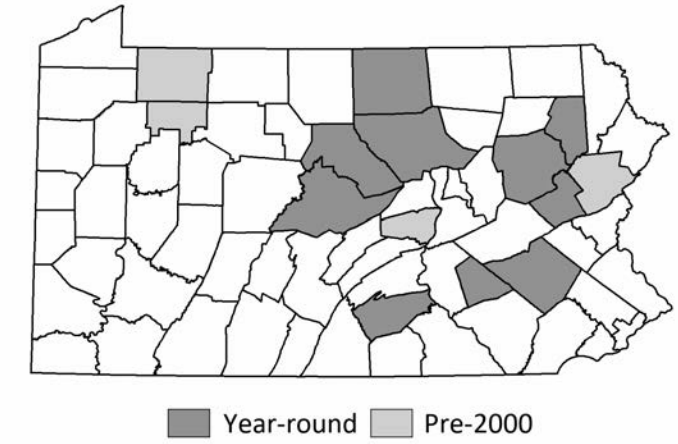
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: pine barrens, scrub oak forests, and open dry woodlands

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Unknown

Specific Threat: Spongy moth pesticide spray

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium

Action Urgency: Initiate immediately

Measure: Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

Latifovic, L. and M.A. Arain. 2024. The impact of spongy moth (Lymantria dispar dispar) defoliation on carbon balance of a temperate deciduous forest in North America. Agricultural and Forest Meteorology 354: 110076.

Leroy, B.M., H. Lemme, P. Braumiller, T. Hilmers, M. Jacobs, S. Hochrein, S. Kienlein, J. Müller, H. Pretzsch, K. Stimm, S. Seibold, J. Jaworek, W.A. Hahn, S. Müller-Kroehling, W.W. Weisser. 2021. Relative impacts of gypsy moth outbreaks and insecticide treatments on forest resources and ecosystems: An experimental approach. Ecological Solutions and Evidence, 2: e12045.

Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

Spongy moth outbreaks - impact of outbreaks versus treatments (2024)

Wagner, D.L., J.W. Peacock, J.L. Carter and S.E. Talley. 1996. Field Assessment of Bacillus thuringiensis on Nontarget Lepidoptera. Environmental Entomology 25(6):1444-1454.

PENNSYLVANIA WILDLIFE ACTION PLAN

Willow Dart Moth

Cerastis salicarum

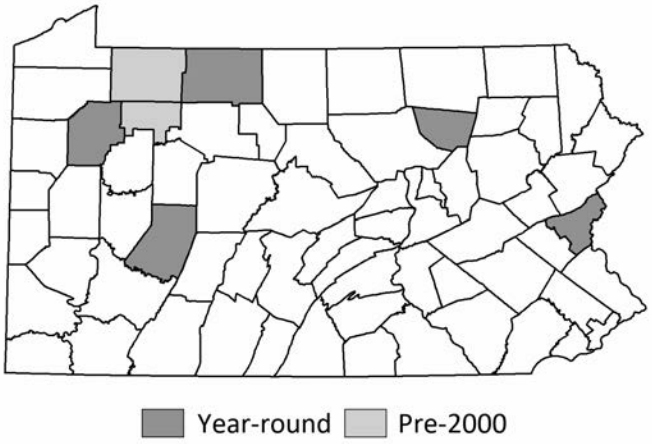
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: moist hardwood-conifer forests, boreal regions, and northern woodland areas

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Sharp Angle Shades Moth

Conservula anodonta

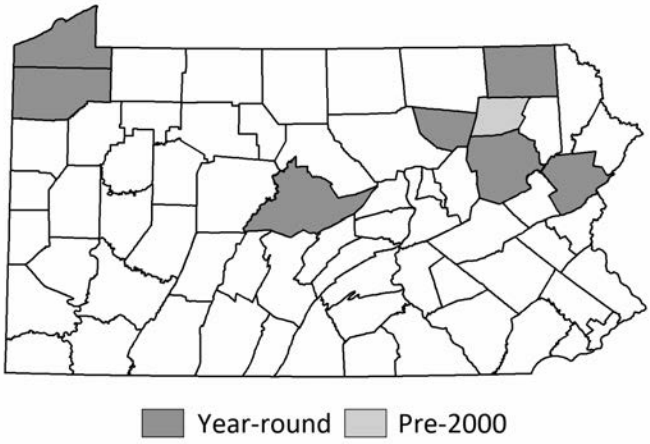
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: mixed and coniferous forests, sometimes wetlands; possibly a fern feeder

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pink Star Moth

Derrima stellata

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Russo

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Open areas. Caterpillars eat pinweed (Lechea spp.)

Primary Habitat: Open Upland

Primary Habitat Type: Agriculture: Cropland/Pastures

Primary Specific Habitat: Shrubland/grassland

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: High - Medium

Specific Threat: Loss of early successional habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open, early successional habitats with a diverse variety of native plants; control invasive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A lichen moth

Crambidia xanthocorpa

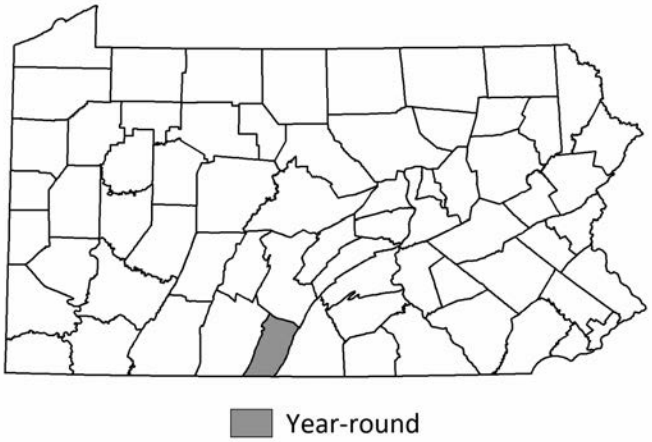
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: woodlands and shale barrens

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Young's Grass-veneer Moth

Crambus youngellus

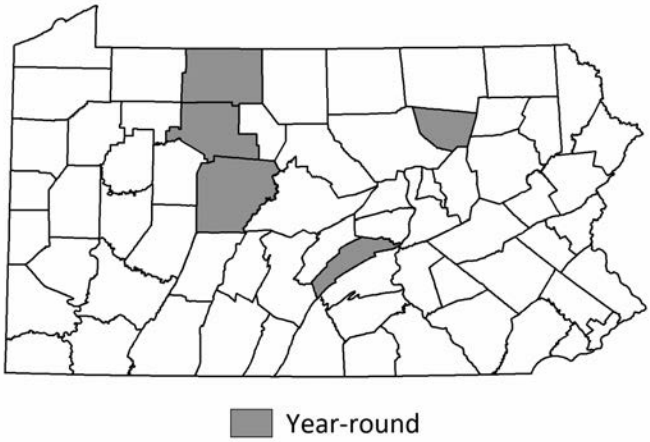
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Clermont

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: This species is commonly found in bog habitats in the northern part of the range (Klots, 1963). Documented at three cottongrass fen sites in Pennsylvania (Pete Woods, personal communication).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Conserve specific land or seascapes

Specific Action: Plan for and create buffers around wetlands and green corridors to connect wetlands to other wetlands and floodplains.

Objective: Develop regional and local plans to connect wetlands to other wetlands with protected green corridors, especially utilizing stream and river floodplains. Work with landowners to protect wetland corridors and buffers using conservative easements and other incentives. Maintain or create 100+ foot buffers of natural vegetation around wetlands. Incorporate native plants into landscaping and water infiltration areas, and control invasives so that native plants can thrive. Based on known or potential SGCN species in the local area, protect existing healthy populations of host and nectar plants and incorporate them into new plantings within wetland corridors, buffers, and the adjacent supporting landscape.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: New local and regional plans that identify and prioritize conservation of lands that provide buffers and corridors for wetlands; conservation easements implemented that protect wetlands, buffers and corridors; management of buffers and corridors to protect and enhance natural vegetation and critical resources for wetland butterflies and other wildlife.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage non-living habitat components

Specific Action: Protect and restore wetland hydrology

Objective: Protect and restore the hydrology of open wetland habitats like marshes, bogs, seepages, wet meadows, and riparian areas. Minimize destruction and alteration of hydrological patterns of uplands contributing to wetlands during site development. Minimize conversion of native vegetation of wet meadows into lawn or paved areas. Protect the native vegetation in a minimum 100 foot buffer around wetlands and wet meadows. Conduct research the life history and habitat needs of SGCN species of wetland habitats to inform restoration plans.

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Wetlands with impaired hydrology identified and prioritized for restoration; plans developed to restore natural hydrologic function; Implementation of restoration plans; Best practices implemented near wetlands to protect hydrology and native vegetation; Research projects conducted that investigate the life history and habitat needs of SGCN species of wetland habitats to help inform restoration plans.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife using wetland habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control invasive species and tall woody vegetation; Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs

Objective: Herbicides are an important management tool to prevent regrowth of woody vegetation, and reduce the long term effort needed to control trees and invasive plants. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Use aquatic formulation glyphosate with LI-700 non-ionic surfactant for control of invasive plant species in wetlands. Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Woody vegetation and invasive species are controlled while best practices are implemented to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of wetland habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create or maintain open wetlands and wet meadows composed primarily of native grasses, sedges, and forbs, with patches of shrubs; control invasive species.

Objective: Use mowing and selective herbicides as needed on a rotational basis to maintain and create early successional wetland habitats (open saturated wetlands, wet grasslands and meadows, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown or invaded habitat to restore, with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of open wetland and wet meadow habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Graphic Moth

Drasteria graphica

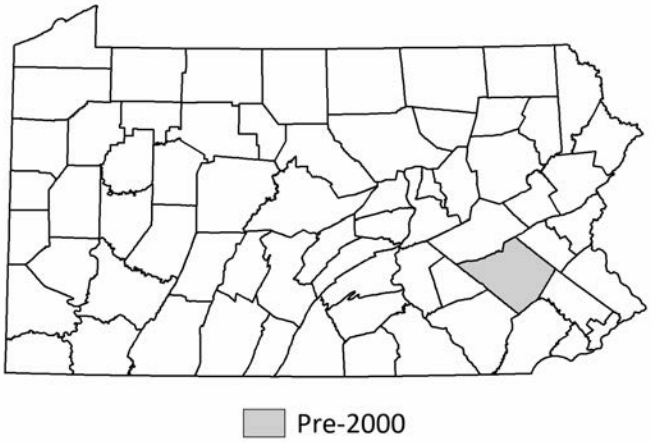
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: sandy barrens with blueberry (Vaccinium spp.)

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, fragmentation, and/or succession

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 4-Low

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Dark Marbled Carpet Moth

Dysstroma citrata

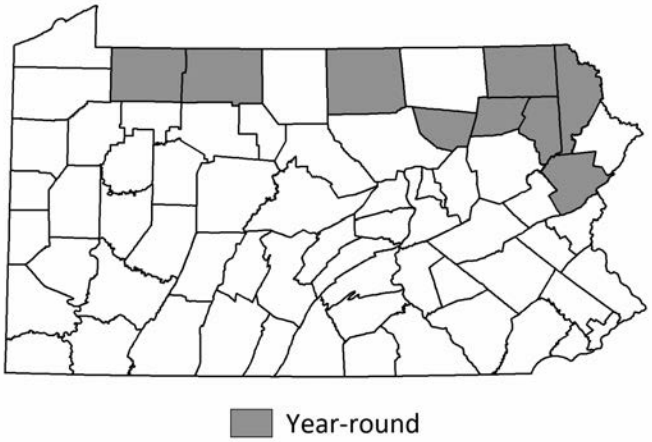
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Deciduous and mixed forests. Uses a number of host plants.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Small Phoenix Moth

Ecliptopera silaceata

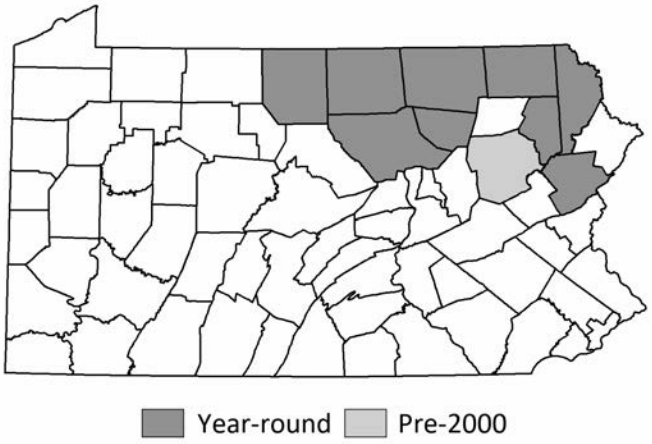
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open wetlands and uplands. Larvae feed on jewelweed (Impatiens spp.) and fireweed (Chamerion angustifolium).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior Freshwater Marsh

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Streaked Ethmia Moth

Ethmia longimaculella

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Lightly forested, moderately calcareous soils. Often found in Yellow Oak - Redbud Woodland

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Invasive plants and loss of native plant diversity

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and areas with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Zeller's Glass Miner Moth

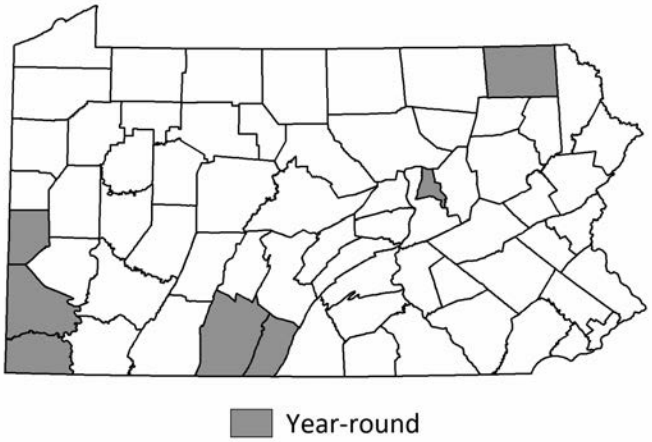
Ethmia zelleriella

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of its distribution.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: on Miami Mist: Mesic deciduous forests in southwest PA. on Appalachian Phacelia: shale woodlands and outcrops in south-central to southeast PA.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plants of this specialist moth are particularly susceptible to invasive plants, which crowd the host plant out of its habitat. While the host plants may not be catastrophically impacted in the next ten years, but a slow and steady decline of host plants is expected in the absence of action.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Identify sites where Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) occur on state lands. Evaluate those sites for invasive plants, and use herbicide to control the plants in cases where they threaten the Phacelia species.

Objective: Evaluate 9 populations of Phacelia spp. on state lands, and actively manage all that are threatened by invasive plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Percent control of invasive species achieved at each site

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Universities & research institutions

Locations: Physiographic Province: Piedmont. Physiographic Section: Waynesburg Hills, Allegheny Mountain, Allegheny Front, Appalachian Mountain, Pittsburgh Low Plateau, Great Valley

Other species likely to benefit from this action: The six SGCN that use Phacelia spp. would benefit; this includes 3 bees: Andrena phaceliae, Andrena lamelliterga, and Hoplitis simplex; and 3 moths: Tinagma gaedikei, Ethmia zelleriella, and Ethmia macelhosiella. Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) would also benefit.

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plants of this specialist moth are particularly susceptible to invasive plants, which crowd the host plant out of its habitat. While the host plants may not be catastrophically impacted in the next ten years, but a slow and steady decline of host plants is expected in the absence of action.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Determine which populations of Phacelia spp. support which of the 6 specialist insects. Most of those insects can be surveyed while the host plants are in bloom (mid- to late May). The moth Ethmia macelhosiella may require a black light survey in October/November. Surveys could be performed by the PA Bee Monitoring Project, WPC, or other qualified individuals.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rubbed Dart Moth

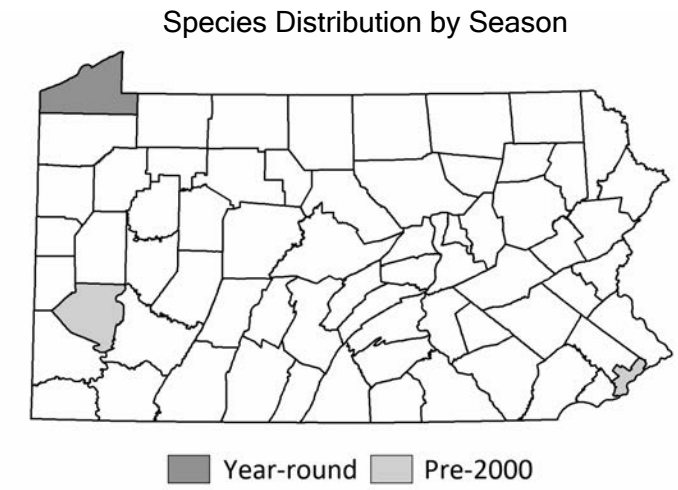
Euxoa detersa

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Larvae burrow in sandy soils and eat the roots of various herbaceous plants.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Open woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning. Restoration of overgrown areas may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Epauletted Pitcher Plant Moth

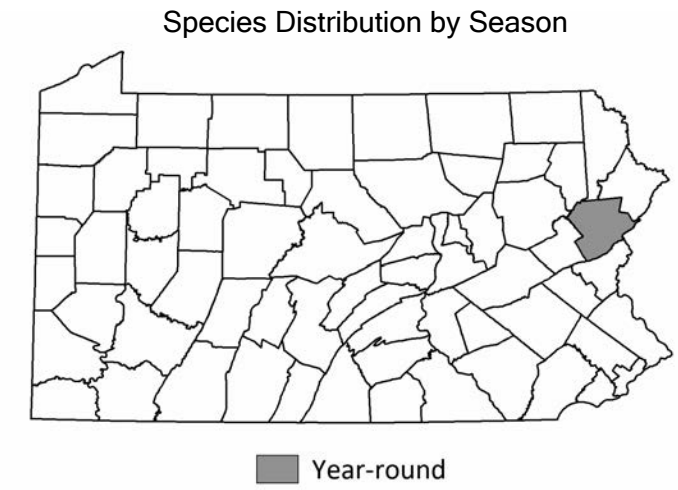
Exyra fax

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Sphagnum bogs with caterpillar food plant, pitcher plants (Sarracenia purpurea).

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Nitrogen input into bogs from the surrounding watershed, whether from agriculture, septic systems, or other sources, degrades the peat substrate of bogs.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement.

Objective: Identify and prioritize bogs for protections. Pursue protection options at high priority sites.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts

Locations: Statewide

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris) Darlington's Harp Ground Beetle (Agonum darlingtoni)

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Only a single population is known from PA, but survey effort has been extremely limited. Additional populations could be found by targeted searches. The Epauletted Pitcher Plan Moth can be detected any time of year that the host plants are not covered by snow.	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Comstock's Sallow Moth

Feralia comstocki

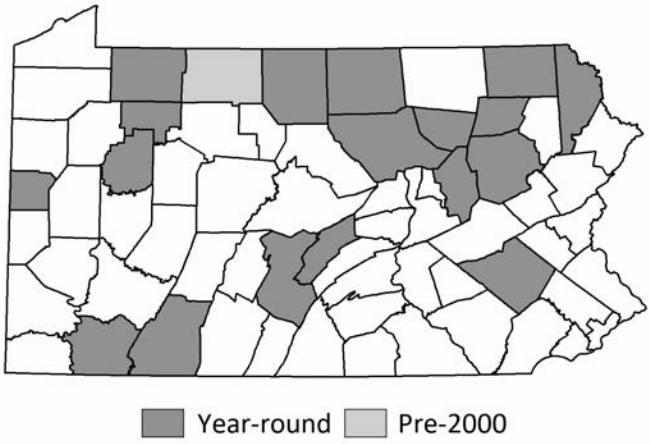
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Moist, cool conifer forests with abundant caterpillar food plant, which is eastern hemlock (Tsuga canadensis) in Pennsylvania.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Low

Specific Threat: Loss of suitable habitat and climatic conditions for one or more life stages, due to changing temperature and precipitation patterns and extremes.

Action Category: Conservation planning

Specific Action: Incorporate invertebrates like moths and butterflies into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** A compilation of best practices related to climate mitigation and resiliency for invertebrates based on species guilds and habitat associations.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other invertebrates impacted by climate change

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Loss of Eastern Hemlock caterpillar food plant due to the invasive hemlock woolly adelgid (Adelges tsugae); use of insecticides treat hemlock woolly adelgid may have non-target effects on forest insects.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Control hemlock woolly adelgid (Adelges tsugae) to protect caterpillar food plant (eastern hemlock), and to sustain the ecological integrity of the habitat. This moth may be impacted by pesticide treatments to control the hemlock woolly adelgid, but treated areas would likely be localized enough that the species could recover from nearby untreated locations.

Objective: Reduce advancement of hemlock woolly adelgid via integrated pest management (IPM) strategies.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Area of hemlock stands treated via IPM and health condition of hemlock trees in treated stands.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Invertebrates of habitats where hemlock is common

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

New Jersey Tea Leafroller Moth

Filatima n. sp.

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of its distribution

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Open, well drained, poor soils.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Overbrowsing by deer. This moth depends exclusively on New Jersey Tea (Ceanothus americana) as a larval food source, but this plant is a favorite food of deer. While this formerly abundant plant is not yet categorized as rare in PA, populations are usually very small, and there are very few populations large enough to sustain a population of this moth

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Install deer fencing around those populations of New Jersey Tea that are known to support specialist herbivores. If data is lacking, assume that larger populations harbor at least one of the SGCN specialists.

Objective: Protect 10 populations of New Jersey Tea with deer exclosures

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number and area of exclosures built; change in area of New Jersey Tea colony

Potential Collaborators: Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulate) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** High - Low

Specific Threat: Fire suppression over the last century may have contributed to the decline of the host plant Ceanothus americana in PA. This moth, however, is probably not able to survive fires, so the habitat must be burned in patches, over time, to allow recolonization from unburned areas.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: When conducting prescribed burns on state lands, identify New Jersey Tea stands within the project area, and incorporate them into the project planning.

Objective: Conduct the burning in patches to ensure that no more than 25% of the New Jersey Tea plants are disturbed by any one round of disturbance, and allow several years for recovery before additional patches of the plant are disturbed.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of burn projects containing New Jersey Tea. Percent of New Jersey Tea plants burned by each of those projects.

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulata) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Overbrowsing by deer. This moth depends exclusively on New Jersey Tea (Ceanothus americana) as a larval food source, but this plant is a favorite food of deer. While this formerly abundant plant is not yet categorized as rare in PA, populations are usually very small, and there are very few populations large enough to sustain a population of this moth

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Protect robust stands of food plants from heavy deer browse.

Objective: Maintain and encourage robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur; promote hunting in areas where the food plant is suppressed by deer browse.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number and area of enclosures built around food plants and key nectar sources; change in abundance or area of food plants

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other pollinators and wildlife that use the food plant

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys for the six New Jersey Tea specialist SGCN should be conducted where medium to large patches of New Jersey Tea are found. Presence of one of these species is evidence that the patch may be large and stable enough to support some of the other species.	Universities & research institutions

No known monitoring programs.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Pink Prominent Moth

Hyparpax aurora

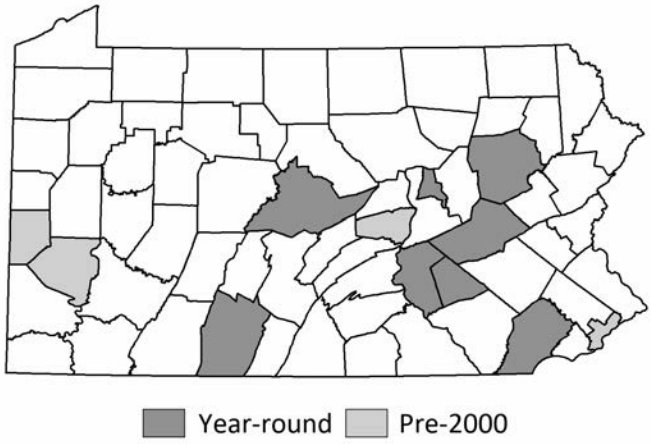
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5?

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: woodlands with scrub oak, forest with oak

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Fire and Fire Suppression

Threat Impact: High - Medium

Specific Threat: Habitat succession due to fire suppression is a threat, but fire as a management tool must be applied with sensitivity to species life history to minimize negative impacts.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Use prescribed fire or mowing to create and maintain grasslands, meadows, barrens and woodlands; apply best practices to reduce mortality of SGCN species and allow recolonization of sensitive species.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain and create early successional habitats (grasslands, meadows, old fields, barrens, etc.). Restoration of overgrown habitats may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 3-Medium

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core open habitats are managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown habitat to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Military and Veterans Affairs, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of early successional habitats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Spongy moth biocontrol agent (Compsilura concinnata)

Action Category: Outreach, communication and distribution

Specific Action: Provide information to land owners and land managers to help ensure that spongy moth control measures are appropriate given the level of infestation, that pesticides are applied appropriately, and that negative impacts are minimized to native species of butterflies and moths, especially Species of Greatest Conservation Need.

Objective: Use sources like the DCNR Spongy Moth web page for identification information and control options for the spongy moth (Lymantria dispar) that do not require pesticide application. For serious infestations where pesticides are justified to prevent tree mortality, use the PA Conservation Explorer tool to check for local rare butterflies and moths prior to applying the pesticides. Contact the DCNR Bureau of Forestry for pesticide impact mitigation best practices for native butterflies and moths, such as: Avoid spraying non-timber areas and when wind speeds raise pesticide drift risk; buffer open habitats by 250 feet; spray each area only once a year or every few years; select Lepidoptera-specific insecticides like Btk or Mimic. When avoidance of rare butterflies or moths is not an option, consider the use of Gypchek, a pesticide formulation of a virus which is specific to the spongy moth, and does not affect other butterfly and moth caterpillars. See best practices for more information.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Percentage of spongy moth treatment area that is reviewed for non-target impacts; # of sites where best practices and/or avoidance measures are implemented.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Butterflies and moths

No known research needs.

No known survey priorities.

No known monitoring programs.

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Peacock, J.W., D.F. Schweitzer, J.L. Carter and N.R. Dubois. 1998. Laboratory Assessment of the Effects of Bacillus thuringiensis on Native Lepidoptera. Environmental Entomology 27(2):450-457.

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PENNSYLVANIA WILDLIFE ACTION PLAN

Greater Idia Moth

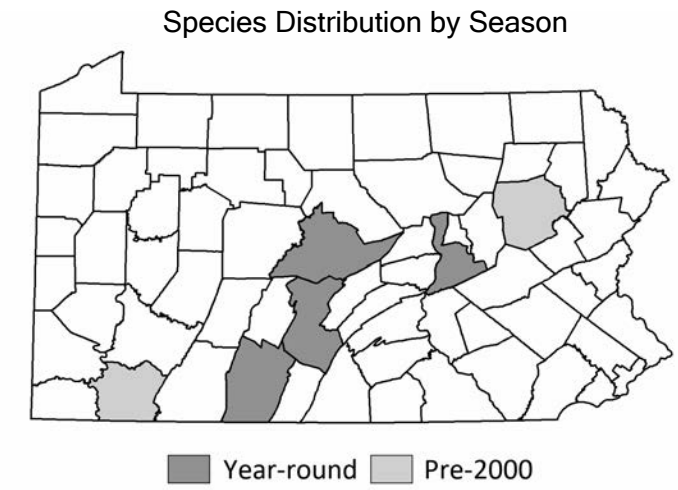
Idia majoralis

Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: woodrat dens; outcrops in deciduous and mixed forest.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** High - Medium

Specific Threat: Decline in populations of the commensal host, the Allegheny woodrat (Neotoma magister)

Action Category: Outreach, communication and distribution

Specific Action: Raise awareness of the moth and its association with woodrat nests in order to increase efforts to document locations of the moth in Pennsylvania. Larvae of this moth live in and pupate inside woodrat nests (the Allegheny woodrat, Neotoma magister in PA). They may use other habitats, but appear to be closely associated with woodrats in Pennsylvania. Conservation actions that benefit woodrats will also benefit this species.

Objective: Develop an identification and life history flier and share information with biologists who monitor woodrat populations; encourage documentation of moths associated with woodrat nest sites.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Distribution of information (# of staff reached, outreach events, etc.)

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Universities & research institutions

Locations: Physiographic Province: Ridge and Valley, Appalachian Plateaus

Other species likely to benefit from this action:

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Woolly Gray Moth

Lycia ypsilon

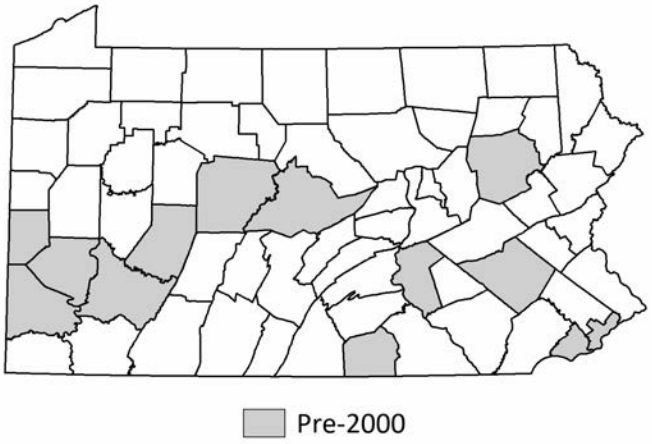
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Dennehy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: barrens, woodlands, forests

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Other Ecosystem Modifications

Threat Impact: Medium - Low

Specific Threat: Loss of barrens habitats due to conversion, succession, and fragmentation.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Create and maintain barrens habitats with diverse vegetative structure, in a landscape-level mosaic of different plant community types.

Objective: Use prescribed fire and/or mowing on a rotational basis to maintain core barrens habitats. Restoration of overgrown barrens may require more intensive management until the desired plant community is achieved. Follow best practices to reduce potential negative impacts to SGCN wildlife.

Action Priority: 4-Low

Action Urgency: Initiate within 5 years

Measure: 20-25% of the core barrens habitat is managed on a rotational basis, with retreatment of each management unit occurring every 4-5 years. Where feasible, select additional acreage of overgrown barrens to restore with the goal of increasing the size of the core habitat by 5-10% every 5 years until target habitat size is reached.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Insects of barrens and woodland habitats

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

MacElhose's Ethmia Moth

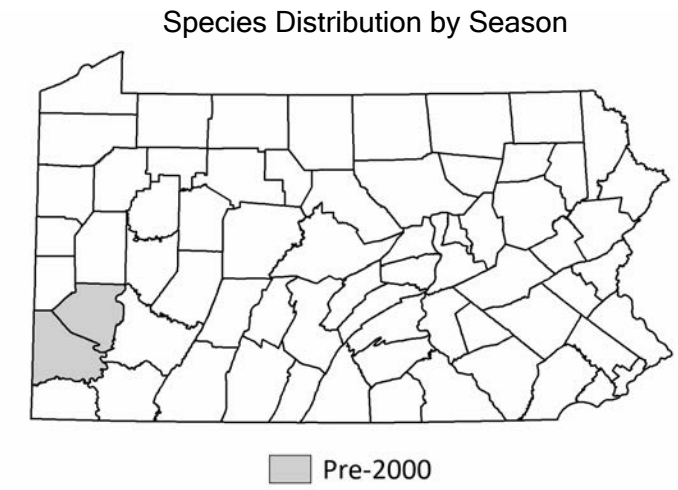
Ethmia macelhosiella

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



J. Mcintyre



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and continue to survey for new ones.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: on Miami Mist: Mesic deciduous forests in southwest PA. on Appalachian Phacelia: shale woodlands and outcrops in south-central to southeast PA.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plants of this specialist moth are particularly susceptible to invasive plants, which crowd the host plant out of its habitat. While the host plants may not be catastrophically impacted in the next ten years, but a slow and steady decline of host plants is expected in the absence of action.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Identify sites where Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) occur on state lands. Evaluate those sites for invasive plants, and use herbicide to control the plants in cases where they threaten the Phacelia species.

Objective: Evaluate 9 populations of Phacelia spp. on state lands, and actively manage all that are threatened by invasive plants.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: Percent control of invasive species achieved at each site

Potential Collaborators: Other state agency, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Universities & research institutions

Locations: Physiographic Province: Piedmont. Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau, Allegheny Mountain, Allegheny Front, Appalachian Mountain, Great Valley, Gettysburg-Newark Lowland, South Mountain, Piedmont Lowland, Piedmont Upland

Other species likely to benefit from this action: The six SGCN that use Phacelia spp. would benefit; this includes 3 bees: Andrena phaceliae, Andrena lamelliterga, and Hoplitis simplex; and 3 moths: Tinagma gaedikei, Ethmia zelleriella, and Ethmia macelhosiella. Appalachian Phacelia (Phacelia dubia) and Miami Mist (P. purshii) would also benefit.

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: The host plants of this specialist moth are particularly susceptible to invasive plants, which crowd the host plant out of its habitat. While the host plants may not be catastrophically impacted in the next ten years, but a slow and steady decline of host plants is expected in the absence of action.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Remove invasive plants using methods tailored to the invasive species present and following best management practices to minimize site disturbance and negative impacts to native plants and wildlife.

Objective: Herbicides are an important management tool to reduce the long term effort needed to control invasive plants and can be used in conjunction with mechanical methods including mowing and hand pulling. Herbicides should be applied in the lowest volume using the most selective methods, to limit negative impacts to native vegetation and wildlife. For example, hand cut trees and treat the stumps, or hack-and-squirt trees that can be left to fall on their own. Mow invasive shrubs and treat cut stems where practical, or spray regrowth with herbicide (versus broadcast foliar spray of full-sized shrubs). Review management needs of all SGCN wildlife known or anticipated on site. Consider life history requirements such as host plants, nectar sources, phenology, and potential sensitivities of different life stages to management. Document key resources and adjust management to protect them.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of sites and area with invasive species controlled, with best practices followed to reduce potential negative impacts to native vegetation and SGCN wildlife.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Department of Defense, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Other wildlife impacted by invasive plants

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Determine which populations of Phacelia spp. support which of the 6 specialist insects. Most of those insects can be surveyed while the host plants are in bloom (mid- to late May). The moth Ethmia macelhosiella may require a black light survey in October/November. Surveys could be performed by the PA Bee Monitoring Project, WPC, or other qualified individuals.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A depressariid moth

Agonopterix costimacula

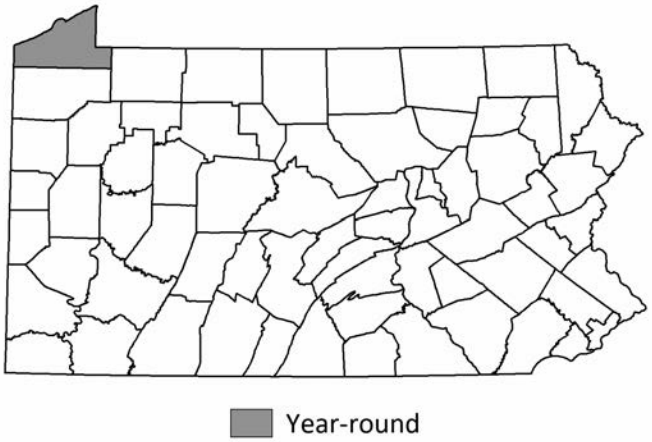
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: The caterpillar foodplant is common hoptree (Ptelea trifoliata), which grows in a variety of habitats including along stream banks, moist or rich woods and thickets, sandy shores.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Riparian & Floodplains

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Direct loss and fragmentation of habitat to development and habitat degradation including conversion of native vegetation to lawn and ornamentals and increased light pollution from outdoor lighting.

Action Category: Outreach, communication and distribution

Specific Action: Promote the protection and enhancement of native vegetation to support pollinators during development projects and in landscaping; promote best practices in outdoor lighting to minimize light pollution.

Objective: Communicate best practices for development with agencies, businesses, developers, municipalities, land owners, etc. Best practices should include strategies to minimize destruction and conversion of habitats that support native plants during site development, minimize conversion of native vegetation into lawn or paved areas, increase native plants in plantings for landscaping and water infiltration areas, and control invasives so that native plants can thrive. For this species, it is essential to protect existing populations of common hoptree (Ptelea trifoliata) and incorporate it into new plantings. Common hoptree is an attractive understory tall shrub or small tree that provides seeds for birds and small mammals, nectar and pollen for pollinators, and is an important caterpillar food plant for insects like the giant swallowtail (Papilio cresphontes) and the hoptree borer moth (Prays atomocella), and this species (the hoptree leaf roller moth, Agonopterix costimacula).

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of new communication channels, partnerships, outreach events and educational materials developed to share information with target audiences.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Association of Conservation Districts, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: pollinators, other insects using common hoptree as a host plant

No known research needs.

No known survey priorities.

No known monitoring programs.

Eisenbeis, G. 2006. Artificial night lighting and insects: attraction of insects to streetlights in a rural setting in Germany. Pp. 281-304 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

Frank, K. 2006. Effects of artifical night lighting on moths. Pp. 305-344 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ash Leaf Cone Roller Moth

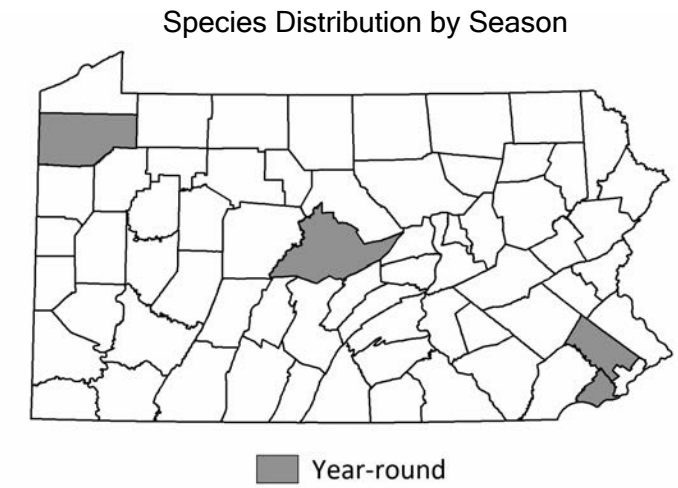
Caloptilia fraxinella

Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



T. Murray



Conservation Profile

PA 10-Year Conservation Goal: Prevent the moth from being extirpated from Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Ash trees; forest

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, presumably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Fringetree Sallow Moth

Sympistis chionanthi

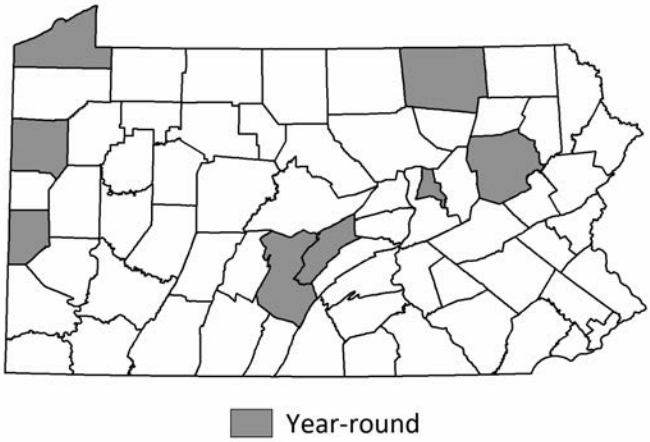
Betsy Leppo, Steve Johnson, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



L. Gaudette

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent this moth from becoming extirpated in Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: ash trees; forest

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, presumably persisting on ash saplings (and to some extent on Chionanthus), but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years. Looking at the iNaturalist and GBIF maps, this species may be extirpated in the lower peninsula of Michigan (ground zero for EAB) where it was formerly common, and the same could occur in PA.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Major Datana

Datana major

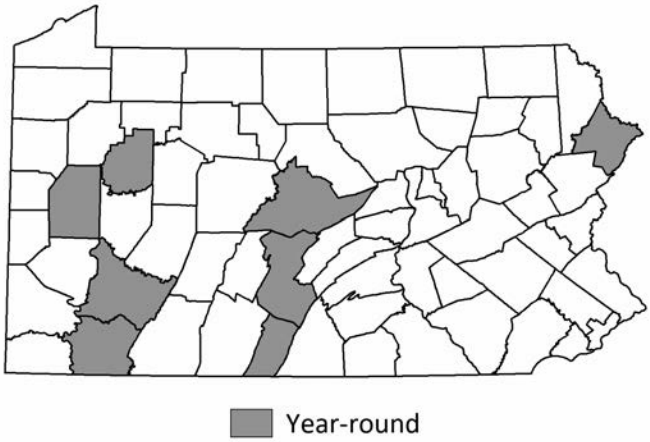
Betsy Leppo, Steve Johnson

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Bogs and swamps, and also barrens and woodlands. Uses a number of heath species as host plants.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Direct loss and fragmentation of habitat to development and habitat degradation including conversion of native vegetation to lawn and ornamentals and increased light pollution from outdoor lighting.

Action Category: Outreach, communication and distribution

Specific Action: Promote the protection and enhancement of native vegetation to support pollinators during development projects and in landscaping; promote best practices in outdoor lighting to minimize light pollution.

Objective: Communicate best practices for development with agencies, businesses, developers, municipalities, land owners, etc. Best practices should include strategies to minimize destruction or conversion of habitats that support native plants during site development, minimize conversion of native vegetation into lawn or paved areas, increase native species in plantings for landscaping and water infiltration areas, and control invasives so that native plants can thrive. Protect robust populations of food plants and key nectar sources for SGCN species where they are known or likely to occur. Share best practices for outdoor lighting to reduce artificial light pollution.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of new communication channels, partnerships, outreach events and educational materials developed to share information with target audiences.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Biological Survey, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: Pollinators and other wildlife

No known research needs.

No known survey priorities.

No known monitoring programs.

Eisenbeis, G. 2006. Artificial night lighting and insects: attraction of insects to streetlights in a rural setting in Germany. Pp. 281-304 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

Frank, K. 2006. Effects of artifical night lighting on moths. Pp. 305-344 in Rich, C. and Longcore, T. (eds.) Ecological Consequences of Artificial Night Lighting. Island Press, Washington, D.C.

PENNSYLVANIA WILDLIFE ACTION PLAN

Mottled Darner

Aeshna clepsydra

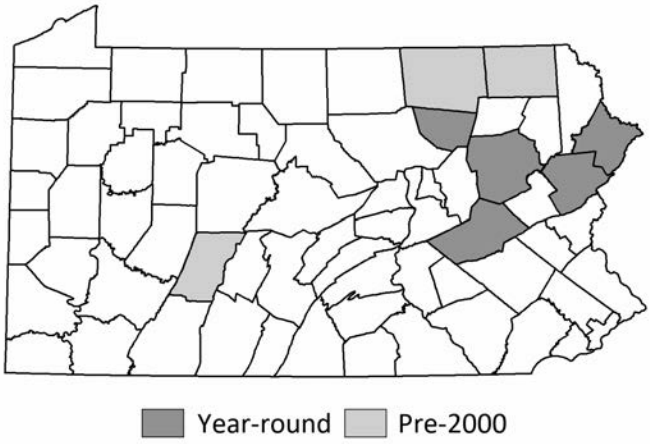
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Koval

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Clear soft waters of small lakes or inlets, with marshy or boggy edges.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution to waterways

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Private Landowners, Susquehanna River Basin Commission

Locations: Physiographic Section: Glaciated Low Plateau, Anthracite Valley, Glaciated Pocono Plateau

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Variable Darner

Aeshna interrupta

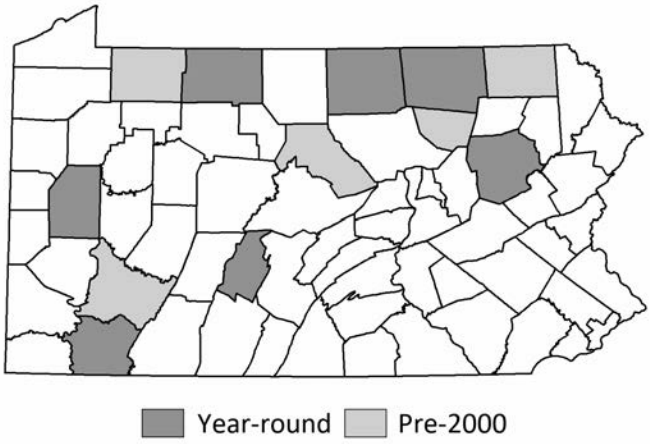
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Lakes and ponds with open water and dense shoreline vegetation.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution to waterways

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Appalachian Plateaus, Ridge and Valley. Physiographic Section: Northwestern Glaciated Plateau, Pittsburgh Low Plateau, Allegheny Mountain, Deep Valleys, Glaciated Low Plateau, Glaciated High Plateau, Susquehanna Lowland, Glaciated High Plateau, Appalachian Mountain

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Seepage Dancer

Argia bipunctulata

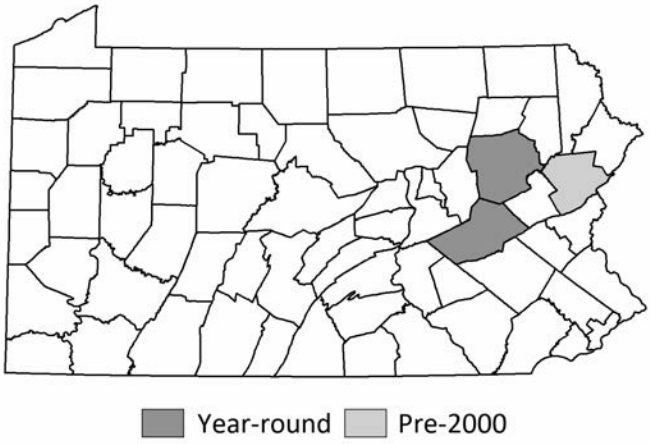
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the species' distribution in PA.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Low gradient streams and seeps.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Medium - Low

Specific Threat: Lowering of groundwater levels, caused by withdrawals for residential/commercial/agricultural use, dry up spring and seep habitats.

Action Category: Conservation planning

Specific Action: Seepage sheds occupied by this species should be prioritized for conservation. Use watersheds as a proxy if seepage patterns are unknown. Minimize groundwater withdrawls and nutrient applications within these areas.

Objective: Incorporate the seepage sheds into conservation plans of municipalities, counties, and local land trusts.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of plans that incorporate conservation of these seepage sheds

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Township Zoning Boards

Locations: Physiographic Section: Anthracite Valley, Glaciated Pocono Plateau, Anthracite Upland, Susquehanna Lowland

Other species likely to benefit from this action: Seepage Dancer (Argia bipunctulata), Brown Spiketail (Cordulegaster bilineata), Tiger Spiketail (Cordulegaster erronea), River Bluet (Enallagma anna), Forcipate Emerald (Somatochlora forcipata), Brush-tipped Emerald (Somatochlora walshii), Gray Petaltail (Tachopteryx thoreyi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Blue-ringed Dancer

Argia sedula

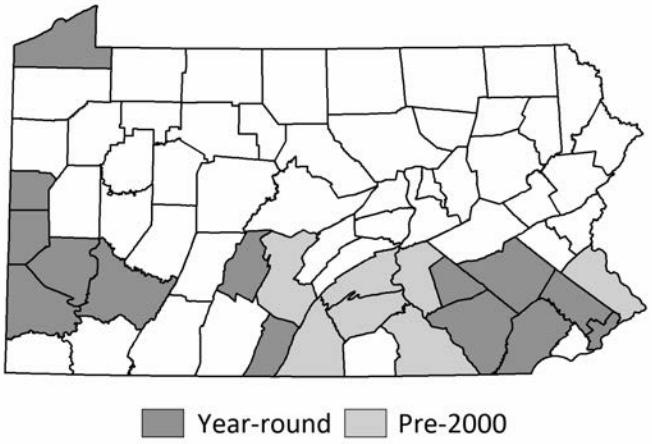
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Slow-flowing, vegetated streams, rivers, or ditches.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners

Locations: Physiographic Province: Central Lowlands, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Atlantic Coastal Plain, Piedmont, Ridge and Valley, Piedmont, New England. Physiographic Section: Eastern Lake, Northwestern Glaciated Plateau, Pittsburgh Low Plateau, Waynesburg Hills, Appalachian Mountain, Lowland and Intermediate Upland, Piedmont Upland, Great Valley, Gettysburg-Newark Lowland, Reading Prong

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

River Jewelwing

Calopteryx aequabilis

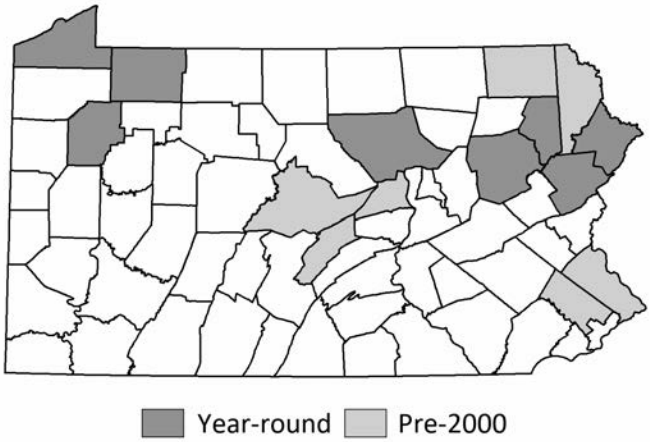
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Koval

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species population in Pennsylvania at current levels through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Clear streams, slow or moderately flowing rivers, all with beds of submerged aquatic vegetation. Sometimes rocky lake shores.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Temperature Extremes **Threat Impact:** Medium

Specific Threat: The appropriate climate envelope for this species is shifting north and out of Pennsylvania. Other climate-related factors, such as changing hydrologic regime, are likely to be operating as well.

Action Category: Conservation planning

Specific Action: Incorporate odonates and other aquatic invertebrates into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate change mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: A compilation of best practices related to climate change mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: River Jewelwing (Calopteryx aequabilis), Taiga Bluet (Coenagrion resolutum), Petite Emerald (Dorocordulia lepida), New England Bluet (Enallagma laterale), Spiny Baskettail (Epitheca spinigera), and Extra-striped Snaketail (Ophiogomphus anomalus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Superb Jewelwing

Calopteryx amata

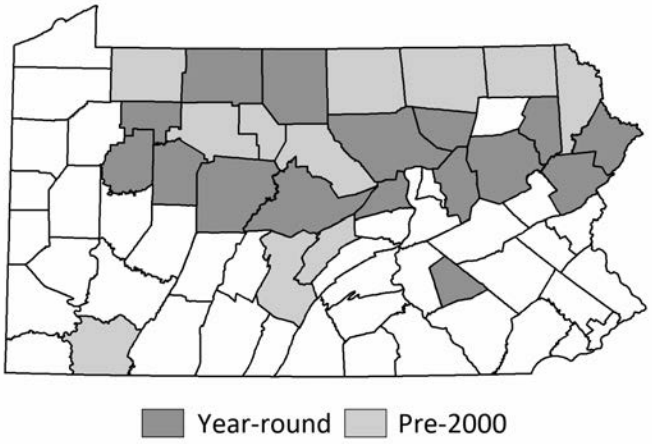
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Leppo

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Clear, cold streams with abundant aquatic vegetation, usually rocky and in wooded landscapes.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners

Locations: HUC4 Watershed: Delaware-Mid Atlantic Coastal, Susquehanna, Allegheny, Susquehanna, Monongahela, U. Ohio

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Appalachian Jewelwing

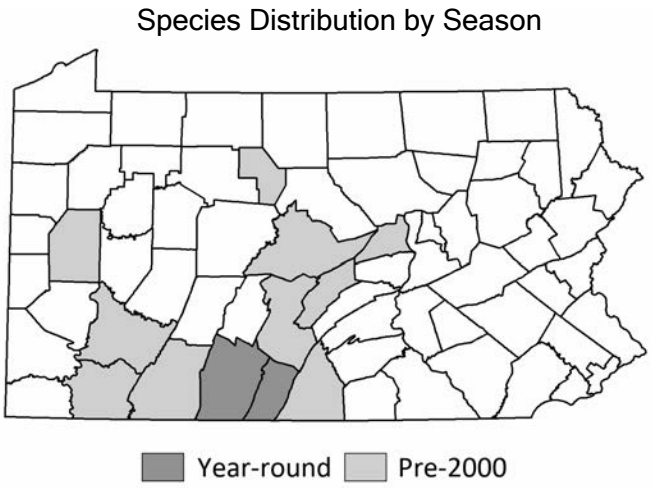
Calopteryx angustipennis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the species' distribution.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Rapids or riffles of small rivers and large streams, usually in woodlands.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Private Landowners

Locations: Physiographic Province: Ridge and Valley. Physiographic Section: Appalachian Mountain. HUC8 Watershed: N. Br. Potomac, Cacapon-Town, Raystown

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Martha's Pennant

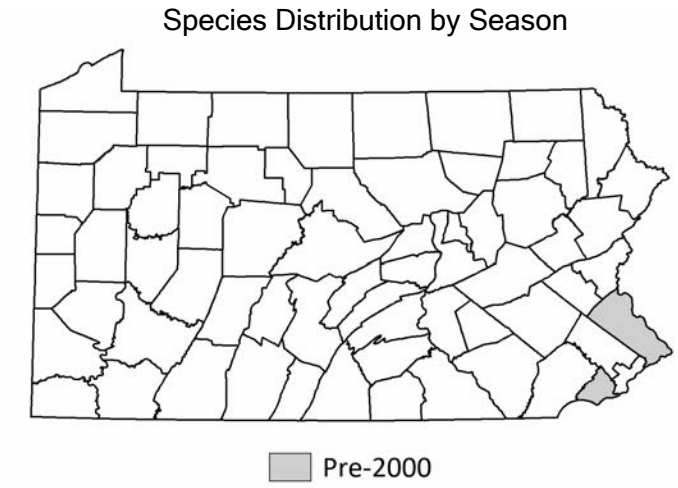
Celithemis martha

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Taterka



Conservation Profile

PA 10-Year Conservation Goal: Determine whether this species is still present in Pennsylvania.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Marshy-bordered ponds, borrow pits, and lakes.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Development along shorelines allows sediment, nutrients, and pollution to enter shoreline habitats.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along shores of water bodies inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Physiographic Section: Gettysburg-Newark Lowland, Piedmont Upland, Lowland and Intermediate Upland, Piedmont Lowland

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Attenuated Bluet (Enallagma daeckii), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Taiga Bluet

Coenagrion resolutum

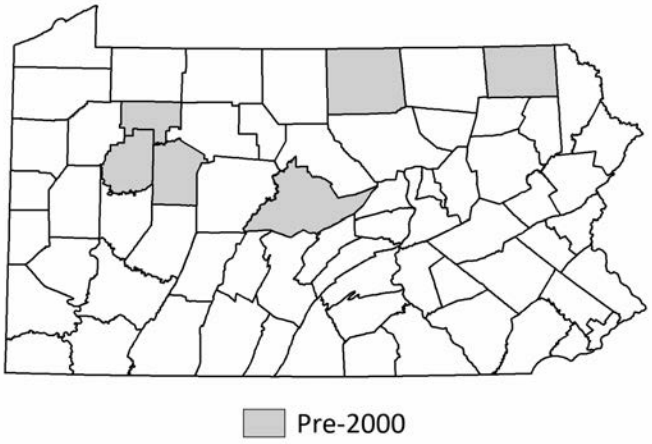
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Wetlands and slow-moving streams.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Temperature Extremes **Threat Impact:** Medium

Specific Threat: The appropriate climate envelope for this species is shifting north and out of Pennsylvania. Other climate-related factors, such as changing hydrologic regime, are likely to be operating as well.

Action Category: Conservation planning

Specific Action: Incorporate odonates and other aquatic invertebrates into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate change mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: A compilation of best practices related to climate change mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service

Locations: Statewide

Other species likely to benefit from this action: River Jewelwing (Calopteryx aequabilis), Petite Emerald (Dorocordulia lepida), New England Bluet (Enallagma laterale), Spiny Baskettail (Epitheca spinigera), and Extra-striped Snaketail (Ophiogomphus anomalus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Brown Spiketail

Cordulegaster bilineata

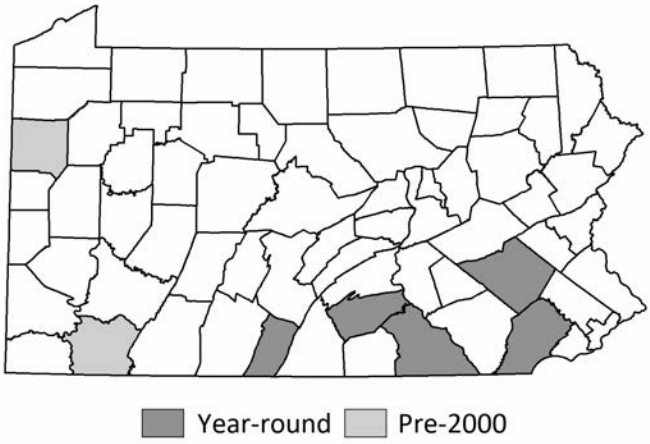
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the species' distribution in PA.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Very small, sunny woodland streams and seeps.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Medium - Low

Specific Threat: Lowering of groundwater levels, caused by withdrawals for residential/commercial/agricultural use, dry up spring and seep habitats.

Action Category: Conservation planning

Specific Action: Seepage sheds occupied by this species should be prioritized for conservation. Use watersheds as a proxy if seepage patterns are unknown. Minimize groundwater withdrawls and nutrient applications within these areas.

Objective: Incorporate the seepage sheds into conservation plans of municipalities, counties, and local land trusts.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of plans that incorporate conservation of these seepage sheds

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Township Zoning Boards

Locations: Physiographic Province: Ridge and Valley, Piedmont

Other species likely to benefit from this action: Seepage Dancer (Argia bipunctulata), Tiger Spiketail (Cordulegaster erronea), River Bluet (Enallagma anna), Forcipate Emerald (Somatochlora forcipata), Brush-tipped Emerald (Somatochlora walshii), Gray Petaltail (Tachopteryx thoreyi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Petite Emerald

Dorocordulia lepida

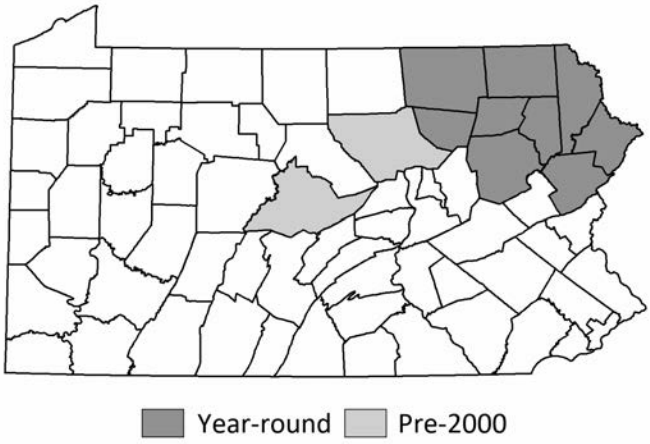
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Koval

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Lakes, ponds, or slow-moving streams, but most often found in acid bog ponds.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Oligotrophic, Low Alkalinity Lake

Season: Year-round

Threat Category: Temperature Extremes

Threat Impact: Medium

Specific Threat: The appropriate climate envelope for this species is shifting north and out of Pennsylvania. Other climate-related factors, such as changing hydrologic regime, are likely to be operating as well.

Action Category: Conservation planning

Specific Action: Incorporate odonates and other aquatic invertebrates into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate change mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: A compilation of best practices related to climate change mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: River Jewelwing (Calopteryx aequabilis), Taiga Bluet (Coenagrion resolutum), Petite Emerald (Dorocordulia lepida), New England Bluet (Enallagma laterale), Spiny Baskettail (Epitheca spinigera), and Extra-striped Snaketail (Ophiogomphus anomalus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

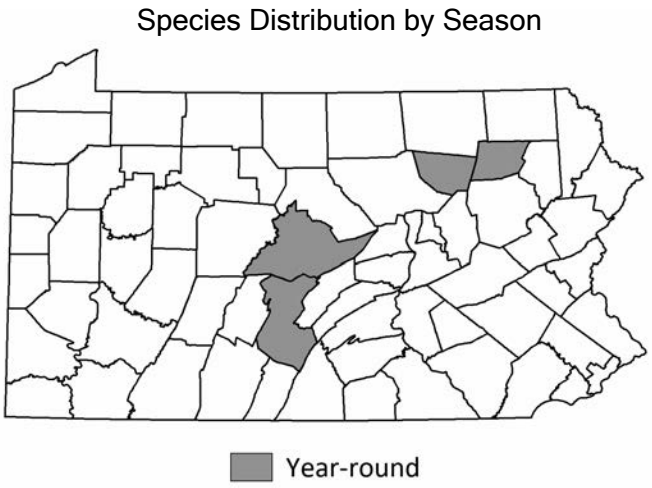
River Bluet

Enallagma anna

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



C. Shiffer



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Slow-flowing streams, rivers, creeks, or ditches.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Medium - Low

Specific Threat: Lowering of groundwater levels, caused by withdrawals for residential/commercial/agricultural use, dry up spring and seep habitats.

Action Category: Conservation planning

Specific Action: Seepage sheds occupied by this species should be prioritized for conservation. Use watersheds as a proxy if seepage patterns are unknown. Minimize groundwater withdrawls and nutrient applications within these areas.

Objective: Incorporate the seepage sheds into conservation plans of municipalities, counties, and local land trusts.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of plans that incorporate conservation of these seepage sheds

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Township Zoning Boards

Locations: Physiographic Section: Appalachian Mountain, Glaciated High Plateau

Other species likely to benefit from this action: Seepage Dancer (Argia bipunctulata), Brown Spiketail (Cordulegaster bilineata), Tiger Spiketail (Cordulegaster erronea), River Bluet (Enallagma anna), Forcipate Emerald (Somatochlora forcipata), Brush-tipped Emerald (Somatochlora walshii), Gray Petaltail (Tachopteryx thoreyi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Boreal Bluet

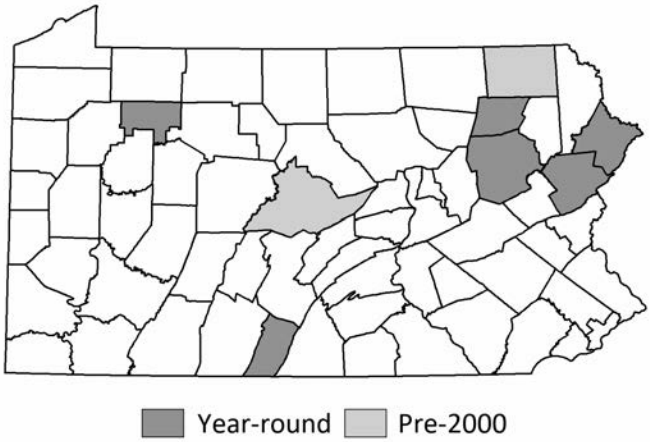
Enallagma boreale

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



J. Johnson

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Pond or lake margins with abundance of emergent vegetation, often cold bog ponds.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution to waterways

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners

Locations: Physiographic Province: Ridge and Valley, Ridge and Valley, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Appalachian Plateaus, Ridge and Valley. Physiographic Section: Appalachian Mountain, Great Valley, Glaciated Low Plateau, Glaciated Pocono Plateau, Anthracite Valley, Glaciated High Plateau, Susquehanna Lowland

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Tule Bluet

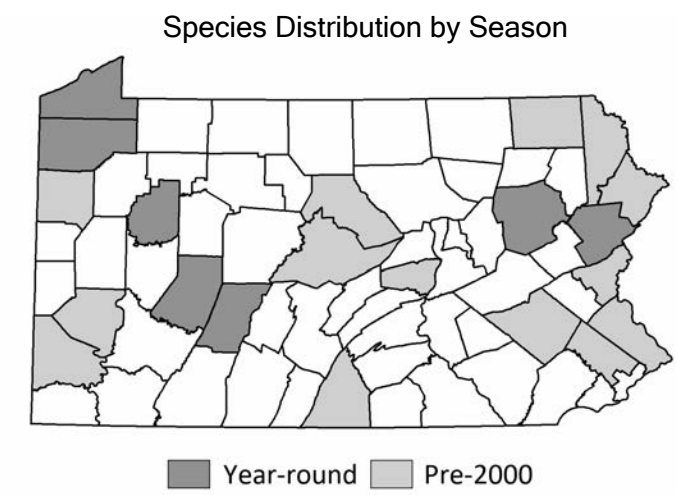
Enallagma carunculatum

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



kcarrol2



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Rivers, lakes, and sometimes ponds.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Warm, Headwaters and Creeks

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution to waterways

Action Category: Manage non-living habitat components

Specific Action: Stormwater runoff, contributing sediment and other pollution to waterways

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Pennsylvania Association of Conservation Districts, Businesses, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Private Landowners

Locations: Physiographic Province: Central Lowlands, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Appalachian Plateaus, Ridge and Valley. Physiographic Section: Eastern Lake, Northwestern Glaciated Plateau, Pittsburgh Low Plateau, Allegheny Mountain, Allegheny Front, Appalachian Mountain, Glaciated Pocono Plateau, Anthracite Valley

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Atlantic Bluet

Enallagma doubledayi

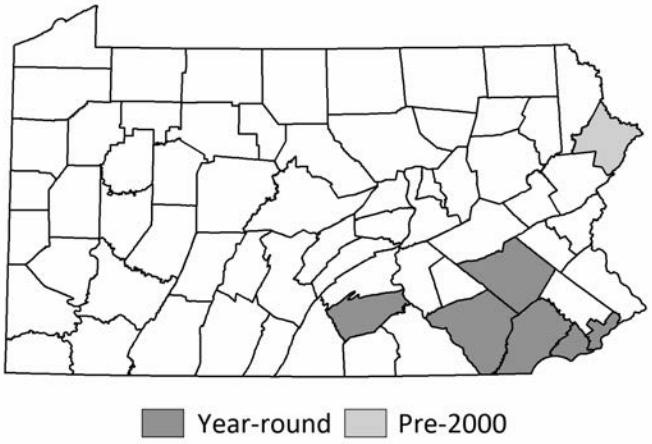
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Ponds, lakes, and ephemeral wetlands in the coastal plain, often with sandy substrates.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover around water bodies currently and formerly inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Physiographic Province: Piedmont, Atlantic Coastal Plain, New England, Piedmont, Piedmont. Physiographic Section: Piedmont Upland, Lowland and Intermediate Upland, Reading Prong, Gettysburg-Newark Lowland, Gettysburg-Newark Lowland

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Seaside Dragonlet (Erythrodiplax berenice), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Big Bluet

Enallagma durum

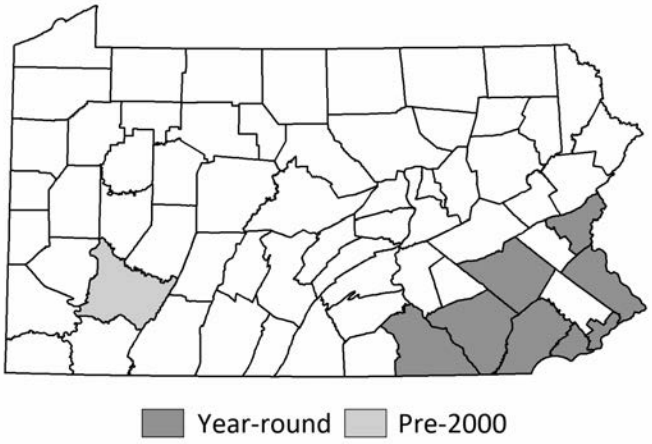
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Freshwater tidal creeks and anthropogenic habitats with fluctuating water levels (e.g., dammed reservoirs).

Primary Habitat: Estuarine

Primary Habitat Type: Tidal Rivers & Streams

Primary Specific Habitat: Tidal Headwaters and Creeks

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover around water bodies currently and formerly inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Physiographic Province: Atlantic Coastal Plain, Piedmont, Piedmont. Physiographic Section: Lowland and Intermediate Upland, Piedmont Upland, Gettysburg-Newark Lowland

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Seaside Dragonlet (Erythrodiplax berenice), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

New England Bluet

Enallagma laterale

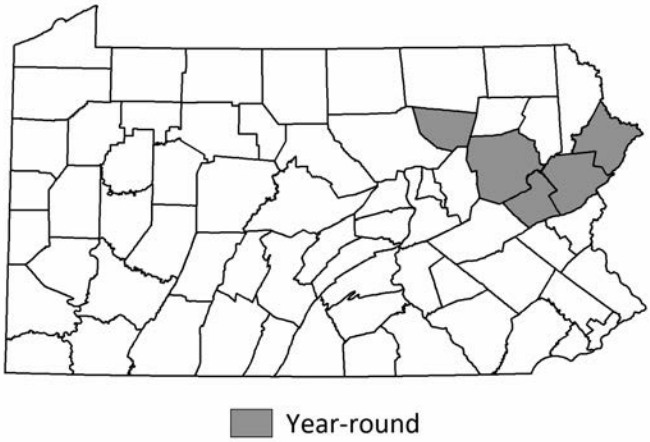
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2025

NatureServe Global Rank: G3G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Vegetated, acidic, ponds and lakes, often with boggy edges.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Oligotrophic, Low Alkalinity Lake

Season: Year-round

Threat Category: Temperature Extremes

Threat Impact: Medium

Specific Threat: The appropriate climate envelope for this species is shifting north and out of Pennsylvania. Other climate-related factors, such as changing hydrologic regime, are likely to be operating as well.

Action Category: Conservation planning

Specific Action: Incorporate odonates and other aquatic invertebrates into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate change mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: A compilation of best practices related to climate change mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission

Locations: HUC8 Watershed: U. Susquehanna-Tunkhannock, U. Susquehanna-Lackawanna, Lackawaxen, Mid. Delaware-Mongaup-Brodhead

Other species likely to benefit from this action: River Jewelwing (Calopteryx aequabilis), Taiga Bluet (Coenagrion resolutum), Petite Emerald (Dorocordulia lepida), Spiny Baskettail (Epitheca spinigera), and Extra-striped Snaketail (Ophiogomphus anomalus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Slender Baskettail

Epitheca costalis

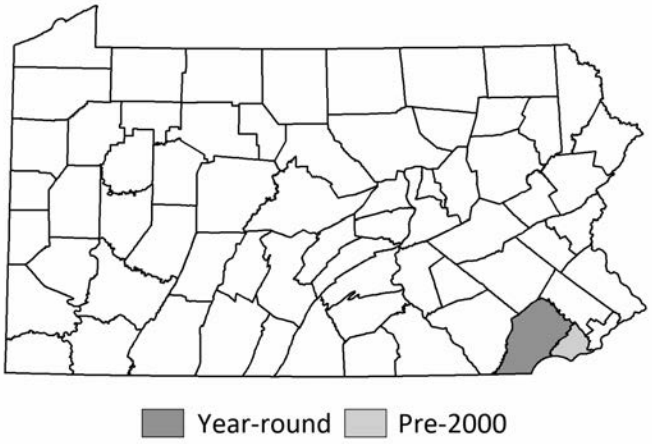
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Z. Kemp

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the species' distribution in the state.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Sandy ponds or lakes, also slow streams.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover around water bodies currently and formerly inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC6 Watershed: Lower Delaware

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Seaside Dragonlet (Erythrodiplax berenice), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Spiny Basketail

Epitheca spinigera

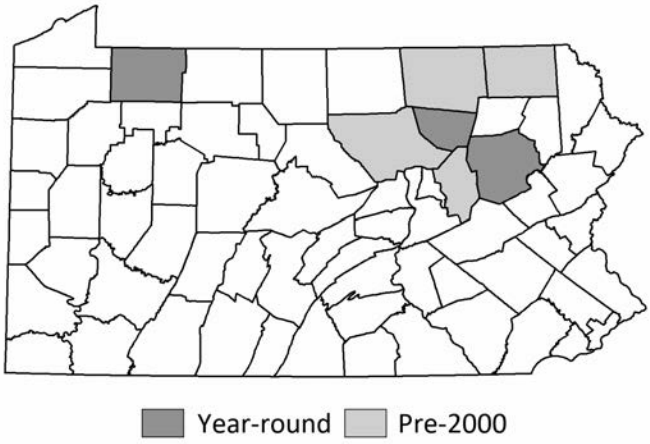
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



safechrislaurie

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Boggy or marshy lakes and ponds, often wooded. Sometimes small, slow streams.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Temperature Extremes **Threat Impact:** Medium

Specific Threat: The appropriate climate envelope for this species is shifting north and out of Pennsylvania. Other climate-related factors, such as changing hydrologic regime, are likely to be operating as well.

Action Category: Conservation planning

Specific Action: Incorporate odonates and other aquatic invertebrates into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate change mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: A compilation of best practices related to climate change mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: River Jewelwing (Calopteryx aequabilis), Taiga Bluet (Coenagrion resolutum), Petite Emerald (Dorocordulia lepida), New England Bluet (Enallagma laterale), and Extra-striped Snaketail (Ophiogomphus anomalus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Seaside Dragonlet

Erythrodiplax berenice

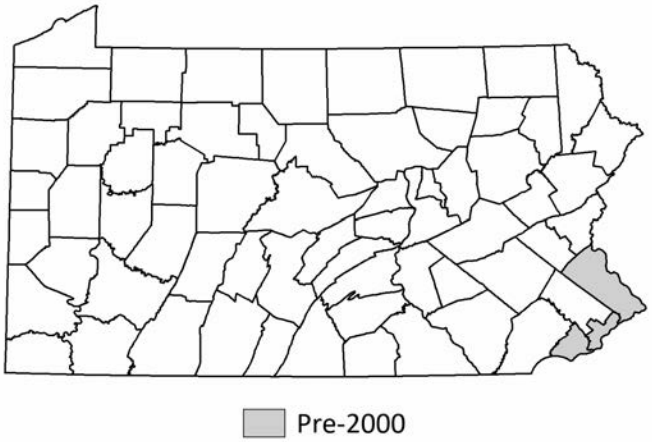
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



G. Lasley

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine is the species is still present in Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Found in salt water habitats, such as salt marshes and saline lakes.

Primary Habitat: Estuarine

Primary Habitat Type: Tidal Wetlands & Flats

Primary Specific Habitat: Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Sediment and nutrients from storm water

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: In Philadelphia and the surrounding area, increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, Township Zoning Boards

Locations: HUC4 Watershed: Delaware-Mid Atlantic Coastal

Other species likely to benefit from this action: Blue Crab

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

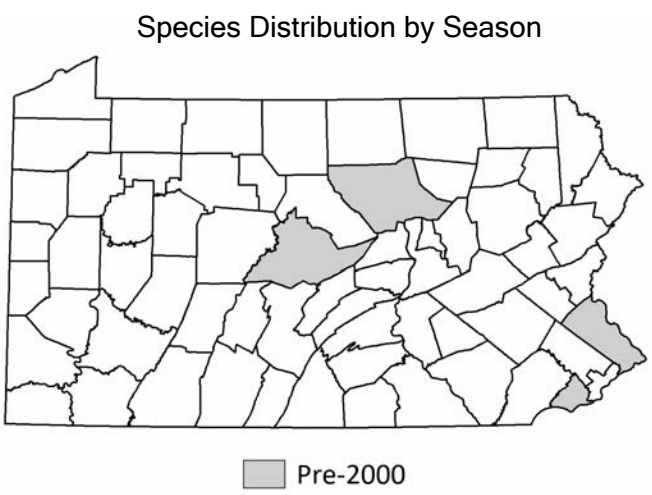
Little Blue Dragonlet

Erythrodiplax minuscula

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Determine if the species still occurs in Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Shallow marshy ponds and edges of lakes; slow moving streams.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover around water bodies in the area formerly inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC4 Watershed: Susquehanna, Delaware-Mid Atlantic Coastal

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Attenuated Bluet (Enallagma daeckii), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Splendid Clubtail

Gomphurus lineatifrons

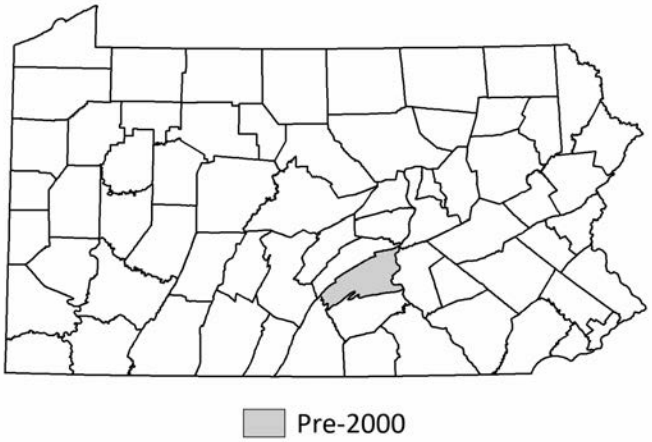
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Improve habitat quality to facilitate the return of the species to Pennsylvania

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Larger, rapidly-flowing streams and rivers, usually rocky.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Stormwater runoff, adding sediment and other pollution to streams

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Susquehanna River Basin Commission, Township Zoning Boards

Locations: HUC6 Watershed: Lower Susquehanna

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Septima's Clubtail

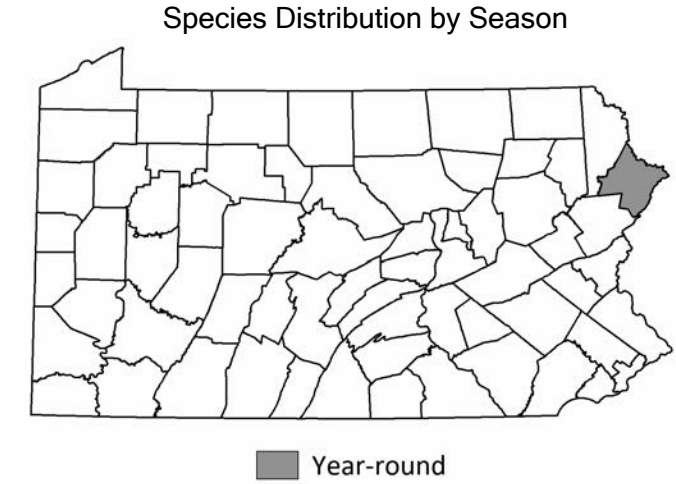
Gomphurus septima delawarensis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Taterka



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population through 2035

NatureServe Global Rank: G3T1

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners

Locations: HUC8 Watershed: U. Delaware, Lackawaxen, Mid. Delaware-Mongaup-Brodhead

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Skillet Clubtail

Gomphurus ventricosus

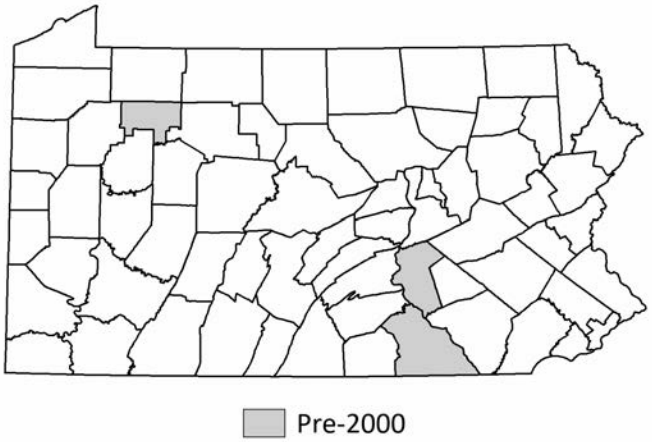
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Improve habitat to facilitate the return of the species to Pennsylvania.

NatureServe Global Rank: G3

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Medium to large rivers with muddy bottoms.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Stormwater runoff, adding sediment and other pollution to streams

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, Susquehanna River Basin Commission, Township Zoning Boards

Locations: HUC6 Watershed: Lower Susquehanna, W. Br. Susquehanna, Allegheny

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Smoky Rubyspot

Hetaerina titia

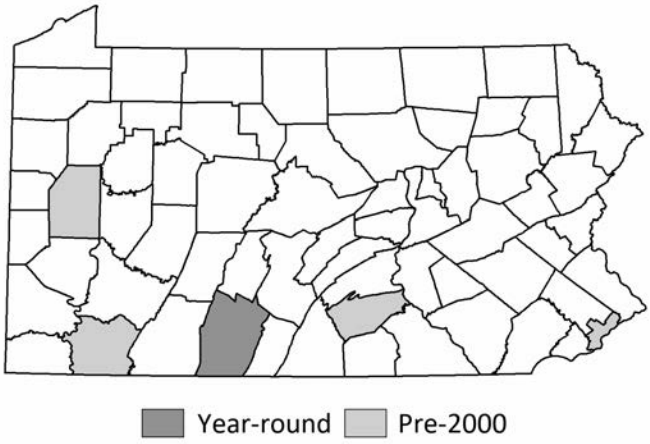
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Make conditions suitable for the return of the species to Pennsylvania

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Faster-flowing rivers and streams.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Spine-crowned Clubtail

Hylogomphus abbreviatus

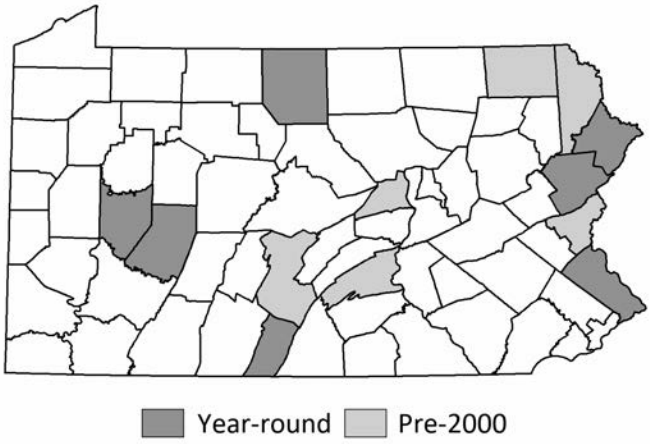
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



madstolefrogs

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Sandy or rocky-bottomed streams and rivers, with muck deposits and moderate current.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Sediment and other pollution, coming from plowed fields

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Sable Clubtail (Stenogomphurus rogersi), Spine-crowned Clubtail (Hylogomphus abbreviatus), Riffle Snaketail (Ophiogomphus carolus), Appalachian Snaketail (Ophiogomphus incurvatus), Maine Snaketail (Ophiogomphus mainensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Green-faced Clubtail

Hylogomphus viridifrons

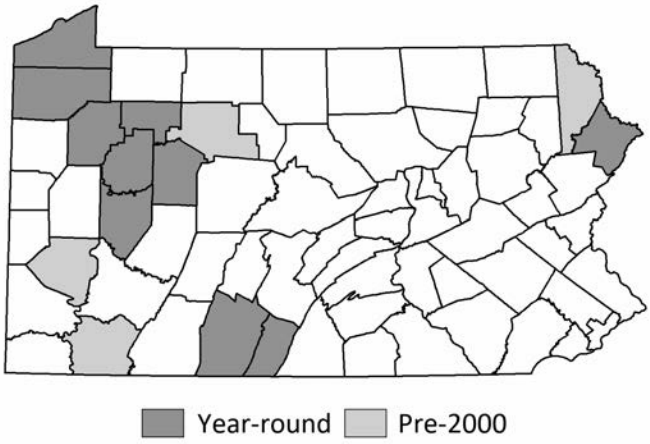
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain populations at current levels through 2035.

NatureServe Global Rank: G3G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Clear, rocky, fast-flowing rivers and streams.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC6 Watershed: Allegheny, Lower Susquehanna, U. Delaware

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Furtive Forktail

Ischnura prognata

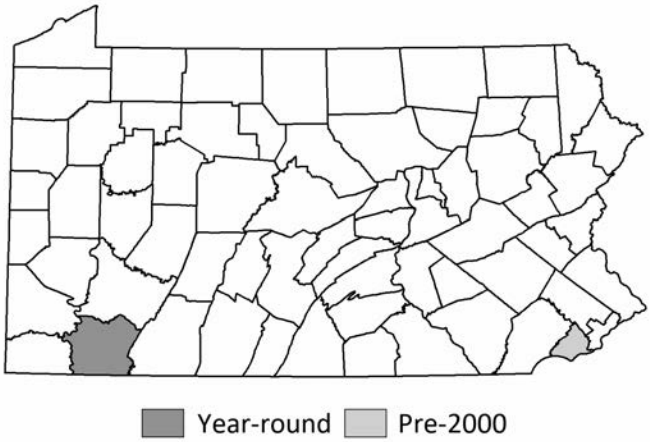
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain currently known populations of the species, and improve our knowledge of its distribution in Pennsylvana.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Shaded swampy ponds and ditches.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Livestock Farming and Ranching

Threat Impact: Low

Specific Threat: Sediment and nutrient runoff from farms.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along shores of water bodies inhabited by this species.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Attenuated Bluet (Enallagma daeckii), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rambur's Forktail

Ischnura ramburii

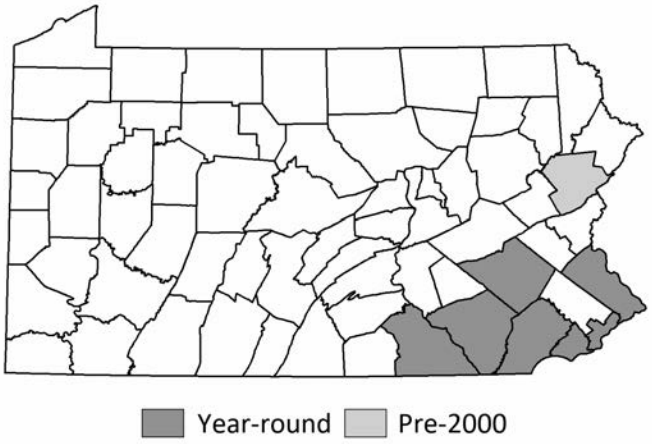
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Increasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Coastal plain marshes, ponds, lakes, and slow moving waters. Usually freshwater or brackish tidal habitats, but sometimes found on dammed portions of rivers with fluctuating water levels.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North Atlantic Coastal Plain Basin Swamp and Wet Hardwood Forest

Season: Year-round

Threat Category: Livestock Farming and Ranching

Threat Impact: Low

Specific Threat: Sediment and nutrient runoff from farms

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain well-vegetated buffers around ponds, lakes, and wetlands.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along wetlands or shores of water bodies inhabited by this species.

Action Priority: 1-Highest

Action Urgency:

Measure: Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC6 Watershed: Lower Susquehanna, Lower Delaware

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Attenuated Bluet (Enallagma daeckii), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

White Corporal

Ladona exusta

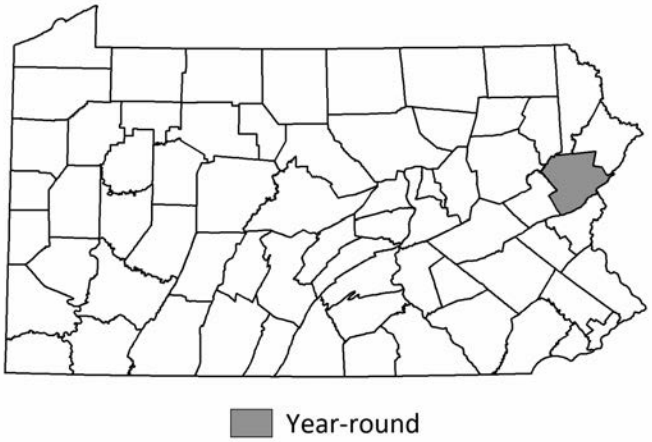
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Woodall

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035. Improve our knowledge of the species' distribution in PA.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Muddy-bottomed lakes inlets and bogs.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along shores of water bodies inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Lehigh, Mid. Delaware-Mongaup-Brodhead

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Attenuated Bluet (Enallagma daeckii), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Emerald Spreadwing

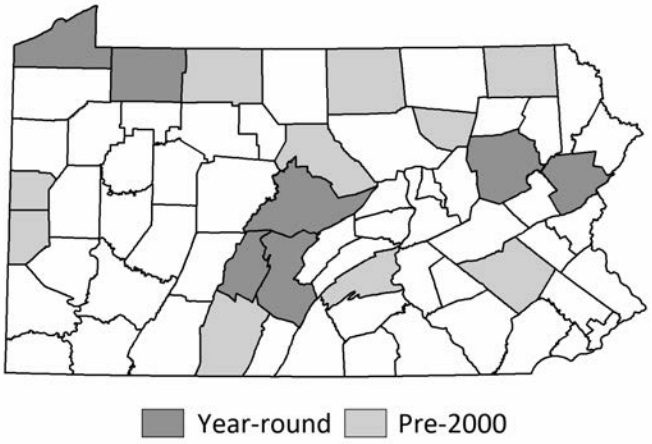
Lestes dryas

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Vegetated ponds, temporary pools, and slower streams.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution to waterways

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection

Locations: Physiographic Province: Appalachian Plateaus, Ridge and Valley, Appalachian Plateaus, Ridge and Valley, Ridge and Valley. Physiographic Section: Northwestern Glaciated Plateau, Appalachian Mountain, Glaciated Pocono Plateau, Susquehanna Lowland, Anthracite Valley

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Belted Whiteface

Leucorrhinia proxima

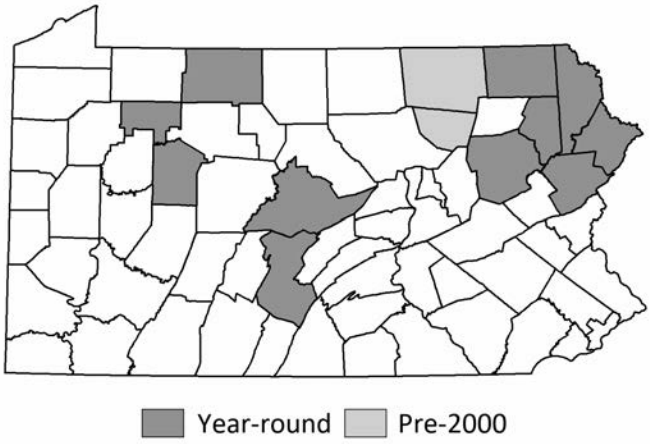
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Vegetated ponds and lake shores, often boggy and embedded in forests.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution to waterways

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley. Physiographic Section: Glaciated Low Plateau, Glaciated Pocono Plateau, Anthracite Valley, Glaciated High Plateau, High Plateau, Deep Valleys, Appalachian Mountain

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Golden-winged Skimmer

Libellula auripennis

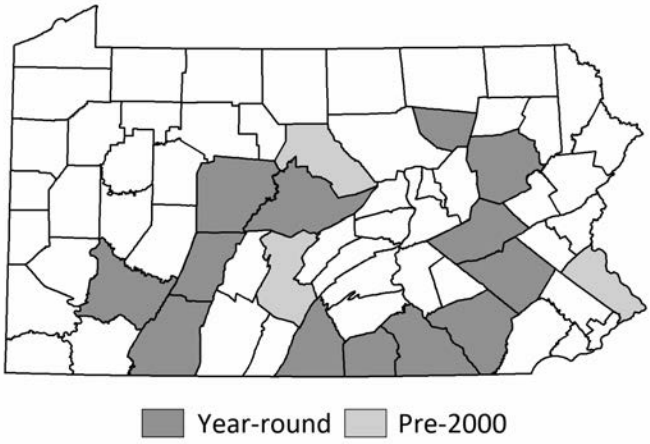
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Vegetated ponds and lakes, sometimes ditches or slow streams.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover around water bodies currently and formerly inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: N. Br. Potomac, Raystown, U. Juniata, Conococheague-Opequon, Monocacy, Lower Susquehanna, Schuylkill, Lower Susquehanna-Swatara, Lower Juniata

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Seaside Dragonlet (Erythrodiplax berenice), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Yellow-sided Skimmer

Libellula flavida

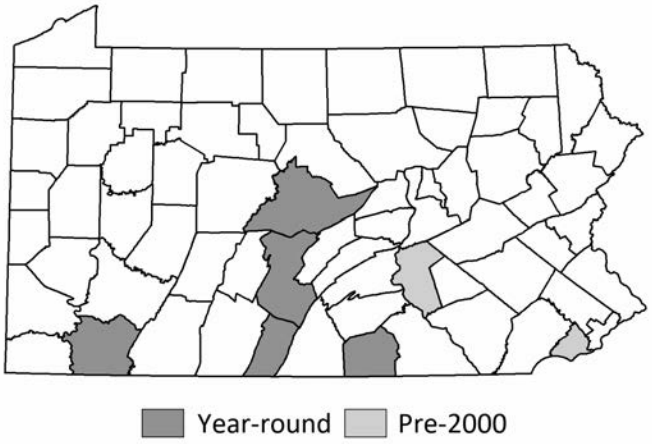
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Marshy and boggy ponds and slow moving waters; acidic wetlands with sphagnum.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover around water bodies currently and formerly inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Youghiogheny, Raystown, Conococheague-Opequon, U. W. Br. Susquehanna, U. Juniata

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Seaside Dragonlet (Erythrodiplax berenice), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Needham's Skimmer

Libellula needhami

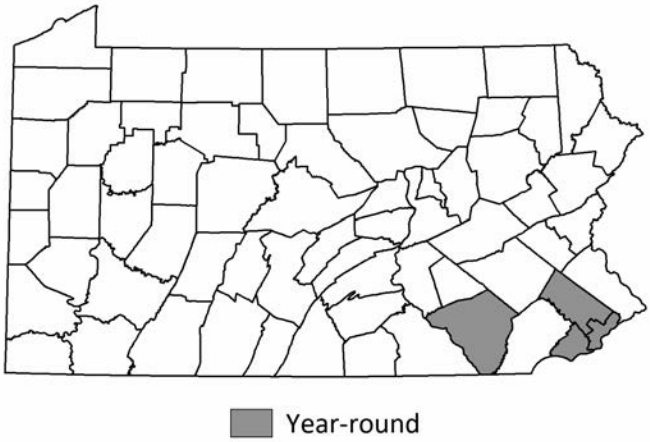
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Ponds, lakes, tidal rivers, and brackish wetlands.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Eutrophic, High Alkalinity Lake

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Development along shorelines allows sediment, nutrients, and pollution to enter shoreline habitats.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along shores of water bodies inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC6 Watershed: Lower Delaware, Lower Susquehanna

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Attenuated Bluet (Enallagma daeckii), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Allegheny River Cruiser

Macromia alleghaniensis

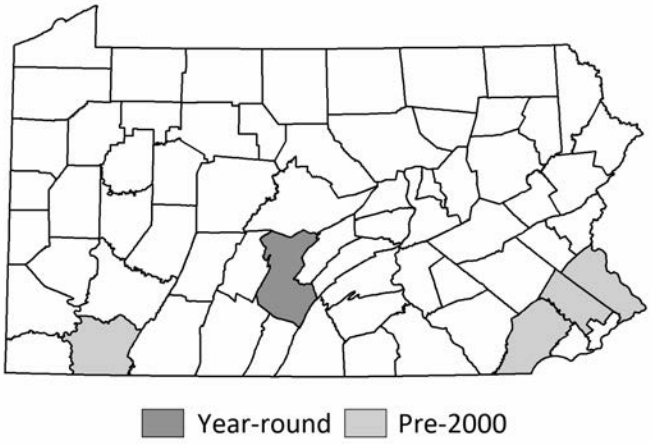
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



A. Graham

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Clean, slow-flowing streams, rivers, and lakes.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, Susquehanna River Basin Commission

Locations: HUC8 Watershed: Schuylkill, U. Juniata

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons))

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Royal River Cruiser

Macromia taeniolata

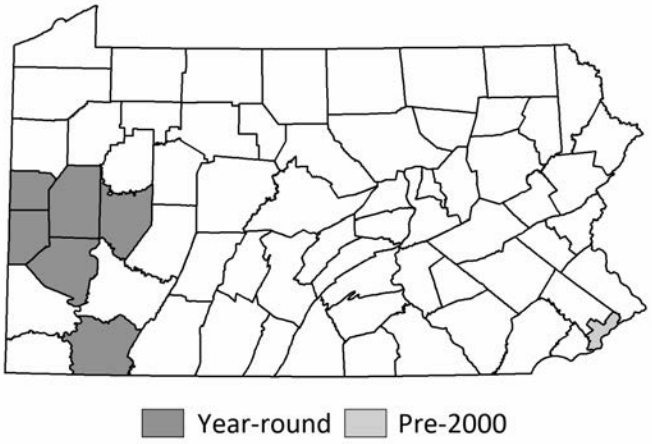
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Slow-flowing rivers and streams, large sandy-bottomed lakes.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover around water bodies currently and formerly inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: U. Ohio, Connoquenessing, Beaver, Mid. Allegheny-Redbank, Lower Allegheny

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Seaside Dragonlet (Erythrodiplax berenice), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Elfin Skimmer

Nannothemis bella

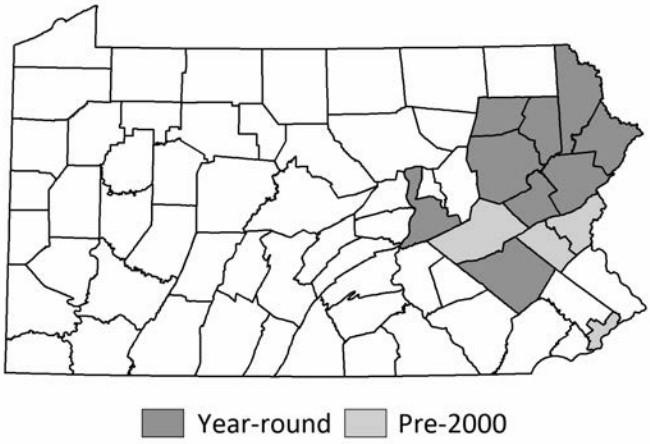
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Bogs, seeps, and fens.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Medium - Low

Specific Threat: Nutrient inputs from fertilizer and manure will degrade peat and destroy bog habitat. Additionally, other agrochemicals can degrade wetland habitats.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement

Objective: Identify and prioritize bogs for protections. Pursue protection options at high priority sites.

Action Priority: **Action Urgency:** **Measure:** number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus. Physiographic Section: Northwestern Glaciated Plateau, Deep Valleys, Glaciated High Plateau, Glaciated Pocono Plateau

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris) Darlington's Harp Ground Beetle (Agonum darlingtoni)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Cyrano Darner

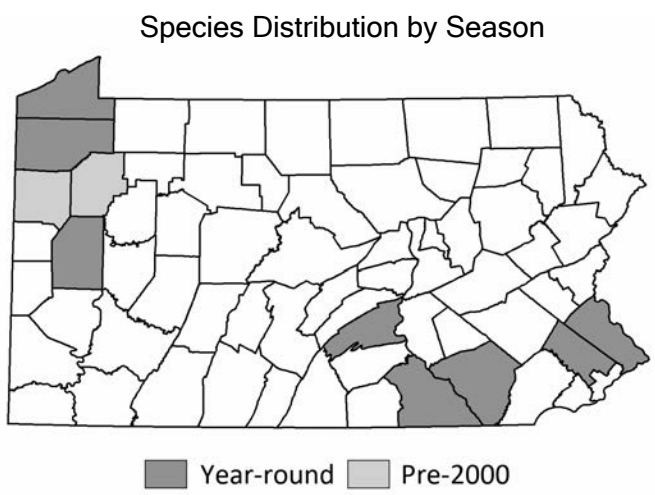
Nasiaeschna pentacantha

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Nirschl



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035, and improve our knowledge of its distribution in the state.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Wooded wetlands, riparian stream corridors, vegetated lake coves.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas

Threat Impact: Low

Specific Threat: Deforestation in riparian areas

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Seaside Dragonlet (Erythrodiplax berenice), Attenuated Bluet (Enallagma daeckii), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Southern Sprite

Nehalennia integricollis

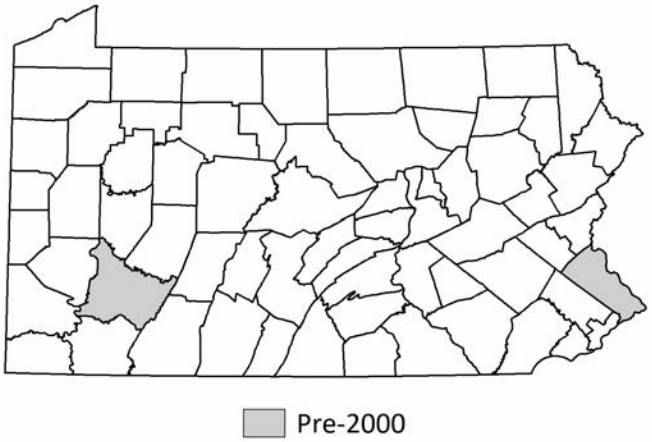
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine if the species is still present in Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Ponds, lakes, marshes, and slow-moving waters with grassy or boggy vegetation.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along shores of water bodies in areas from which this species is known.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Attenuated Bluet (Enallagma daeckii), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Extra-striped Snaketail

Ophiogomphus anomalus

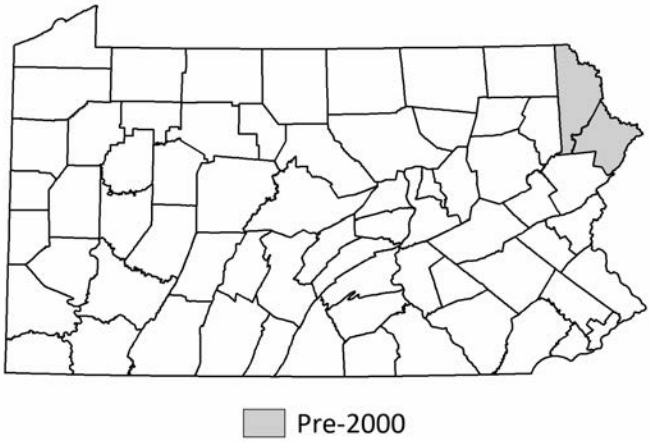
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Conduct surveys to determine if the species is still present in Pennsylvania.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Clean, clear flowing waterways.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Temperature Extremes **Threat Impact:** Medium

Specific Threat: The appropriate climate envelope for this species is shifting north and out of Pennsylvania. Other climate-related factors, such as changing hydrologic regime, are likely to be operating as well.

Action Category: Conservation planning

Specific Action: Incorporate odonates and other aquatic invertebrates into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate change mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: A compilation of best practices related to climate change mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: River Jewelwing (Calopteryx aequabilis), Taiga Bluet (Coenagrion resolutum), Petite Emerald (Dorocordulia lepida), New England Bluet (Enallagma laterale), and Spiny Baskettail (Epitheca spinigera)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Riffle Snaketail

Ophiogomphus carolus

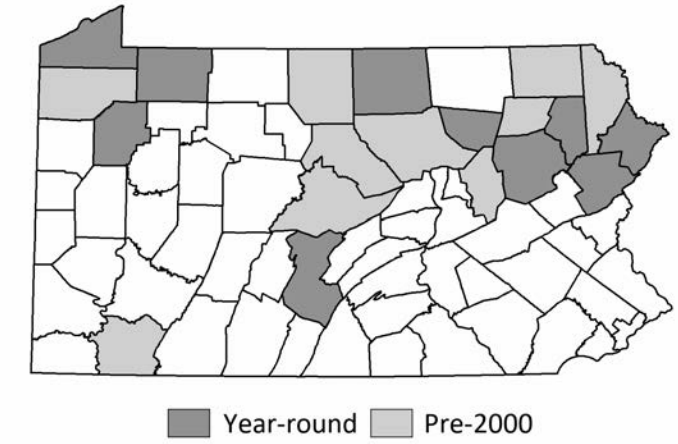
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



B. Leppo

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Clear, rocky streams and rivers, usually forested.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Sediment and other pollution, coming from plowed fields

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Sable Clubtail (Stenogomphurus rogersi), Spine-crowned Clubtail (Hylogomphus abbreviatus), Riffle Snaketail (Ophiogomphus carolus), Appalachian Snaketail (Ophiogomphus incurvatus), Maine Snaketail (Ophiogomphus mainensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pygmy Snaketail

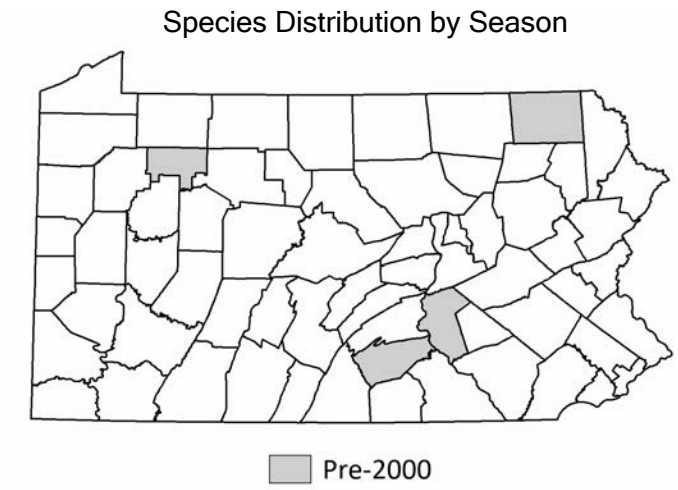
Ophiogomphus howei

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer



Conservation Profile

PA 10-Year Conservation Goal: Improve habitat quality to facilitate the return of this species to Pennsylvania

NatureServe Global Rank: G3

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Larger, rapidly-flowing streams and rivers, usually rocky, with gravel or sandy bottoms.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, Susquehanna River Basin Commission

Locations: HUC8 Watershed: U. Susquehanna

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Appalachian Snaketail

Ophiogomphus incurvatus

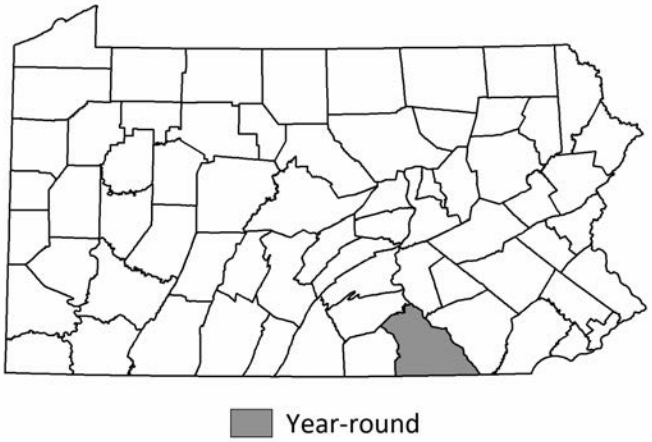
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



plantmanandrew

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035; improve our knowledge of the distribution of this species.

NatureServe Global Rank: G3

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: clear water, riffles over sand or gravel.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Sediment and other pollution, coming from plowed fields

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain well-vegetated habitats along rivers and streams. Occupied stretches of creek should be vegetated in mostly meadow, NOT forest, but headwaters of those streams could be forested.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC10 Watershed: Codorus Cr., S. Br. Codorus Cr., Muddy Cr. (Lower Susquehanna)

Other species likely to benefit from this action: Sable Clubtail (Stenogomphurus rogersi), Spine-crowned Clubtail (Hylogomphus abbreviatus), Riffle Snaketail (Ophiogomphus carolus), Appalachian Snaketail (Ophiogomphus incurvatus), Maine Snaketail (Ophiogomphus mainensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Maine Snaketail

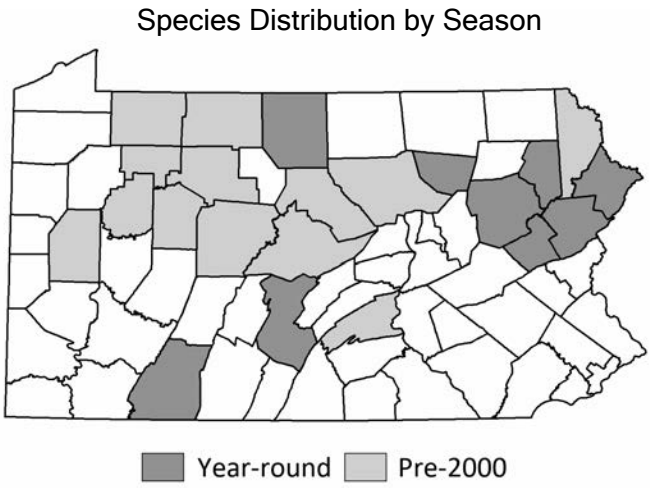
Ophiogomphus mainensis

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our understanding of the species distribution.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Small, rocky, forested streams and rivers.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Sediment and other pollution, coming from plowed fields

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Sable Clubtail (Stenogomphurus rogersi), Spine-crowned Clubtail (Hylogomphus abbreviatus), Riffle Snaketail (Ophiogomphus carolus), Appalachian Snaketail (Ophiogomphus incurvatus), Maine Snaketail (Ophiogomphus mainensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

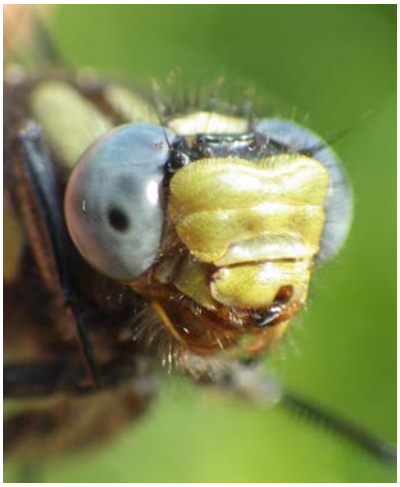
PENNSYLVANIA WILDLIFE ACTION PLAN

Beaverpond Clubtail

Phanogomphus borealis

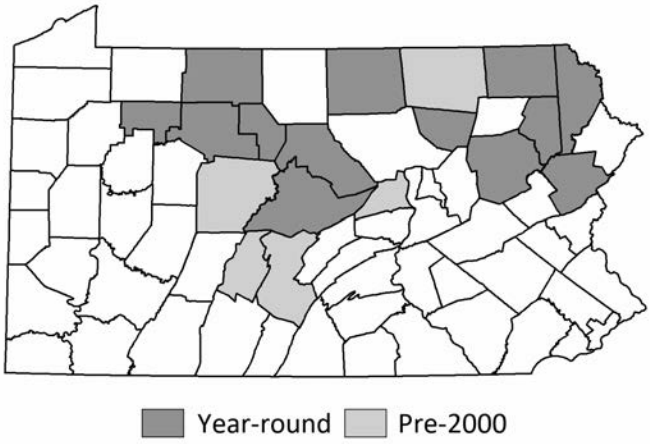
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Marshy or boggy areas along waterways.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution to waterways

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley. Physiographic Section: High Plateau, Pittsburgh Low Plateau, Deep Valleys, Glaciated Low Plateau, Glaciated High Plateau, Glaciated High Plateau, Glaciated Pocono Plateau, Anthracite Valley

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rapids Clubtail

Phanogomphus quadricolor

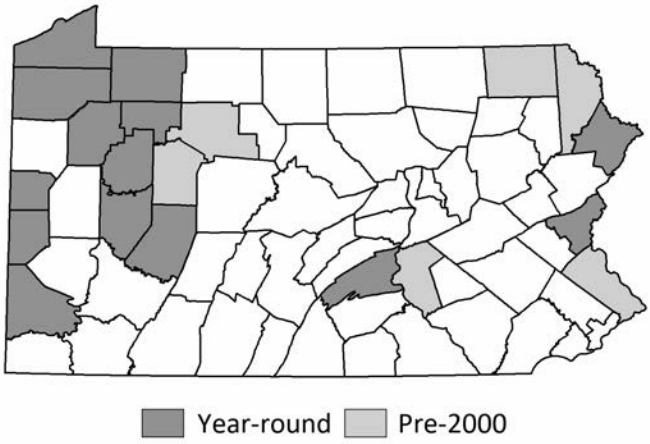
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035

NatureServe Global Rank: G3G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Usually large, fast-flowing rocky streams and rivers. Sometimes slower mud-bottomed rivers.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Stormwater runoff, adding sediment and other pollution to streams

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Private Landowners, Susquehanna River Basin Commission, Township Zoning Boards

Locations: HUC8 Watershed: Mid. Delaware-Mongaup-Brodhead, Lehigh, Lower Susquehanna-Swatara, Schuylkill, Chautauqua-Conneaut, Mid. Allegheny-Tionesta, Connoquenessing, French, Clarion, Mid. Allegheny-Redbank, Lower Allegheny, U. Ohio, Beaver

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Common Sanddragon

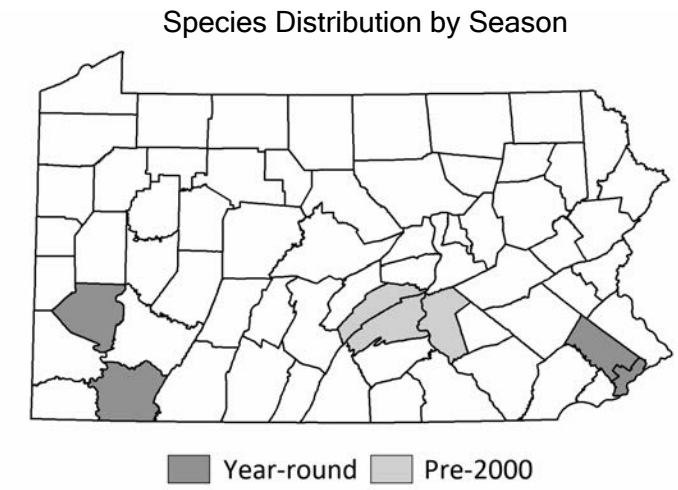
Progomphus obscurus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the species' distribution.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Sandy-bottomed ponds, lakes, and streams.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Sediment and other pollution, coming from plowed fields

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Sable Clubtail (Stenogomphurus rogersi), Spine-crowned Clubtail (Hylogomphus abbreviatus), Riffle Snaketail (Ophiogomphus carolus), Appalachian Snaketail (Ophiogomphus incurvatus), Maine Snaketail (Ophiogomphus mainensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Forcipate Emerald

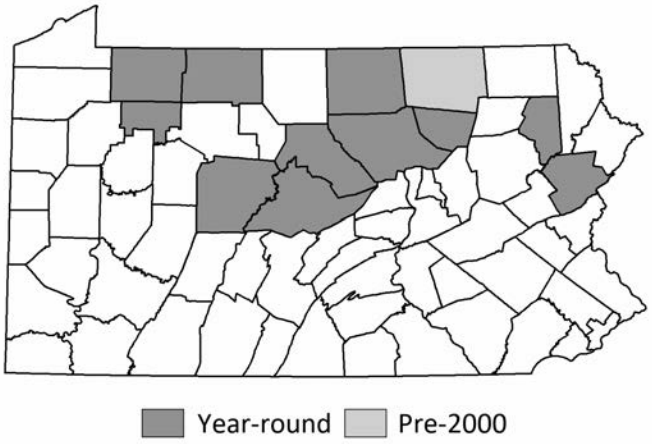
Somatochlora forcipata

Pete Woods ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of its distribution within Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Small, spring-fed bogs, fens, and streams.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Medium - Low

Specific Threat: Lowering of groundwater levels, caused by withdrawals for residential/commercial/agricultural use, dry up spring and seep habitats.

Action Category: Conservation planning

Specific Action: Seepage sheds occupied by this species should be prioritized for conservation. Use watersheds as a proxy if seepage patterns are unknown. Minimize groundwater withdrawls and nutrient applications within these areas.

Objective: Incorporate the seepage sheds into conservation plans of municipalities, counties, and local land trusts.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of plans that incorporate conservation of these seepage sheds

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Township Zoning Boards

Locations: Physiographic Section: High Plateau, Pittsburgh Low Plateau, Deep Valleys, Glaciated High Plateau, Glaciated Low Plateau, Glaciated Pocono Plateau, Glaciated High Plateau, Glaciated High Plateau

Other species likely to benefit from this action: Seepage Dancer (Argia bipunctulata), Brown Spiketail (Cordulegaster bilineata), Tiger Spiketail (Cordulegaster erronea), River Bluet (Enallagma anna), Forcipate Emerald (Somatochlora forcipata), Brush-tipped Emerald (Somatochlora walshii), Gray Petaltail (Tachopteryx thoreyi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Incurvate Emerald

Somatochlora incurvata

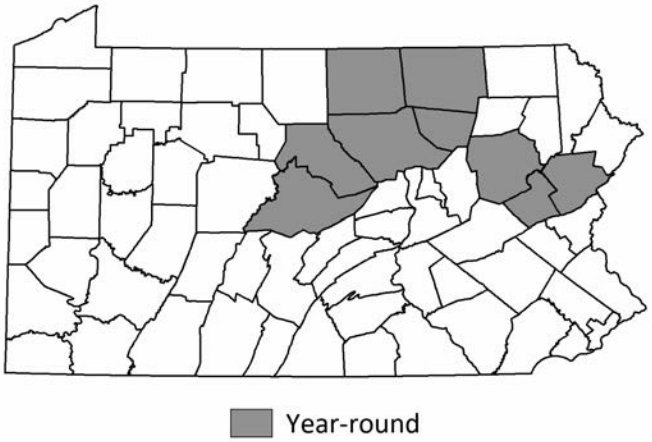
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Pools in bogs.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Medium - Low

Specific Threat: Nutrient inputs from fertilizer and manure will degrade peat and destroy bog habitat. Additionally, other agrochemicals can degrade wetland habitats.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement

Objective: Identify and prioritize bogs for protections. Pursue protection options at high priority sites.

Action Priority: **Action Urgency:** **Measure:** number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus. Physiographic Section: Glaciated Low Plateau, Deep Valleys, Glaciated Pocono Plateau, Glaciated High Plateau, Glaciated Low Plateau, Glaciated High Plateau, Allegheny Front

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris) Darlington's Harp Ground Beetle (Agonum darlingtoni)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Mocha Emerald

Somatochlora linearis

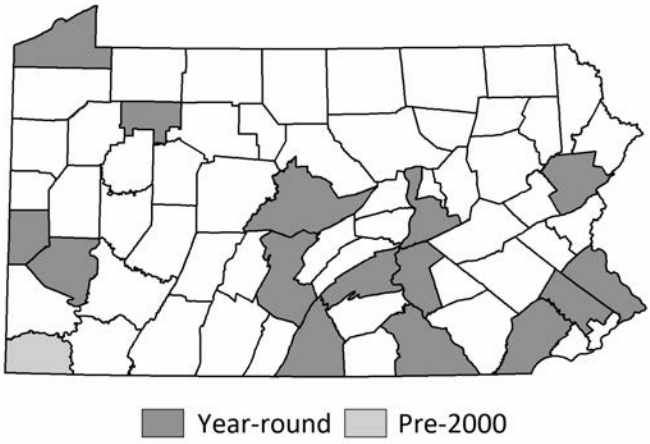
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Small, forested streams, often those that dry to pools in the summer.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Medium - Low

Specific Threat: Lowering of groundwater levels, caused by withdrawals for residential/commercial/agricultural use, dry up spring and seep habitats.

Action Category: Conservation planning

Specific Action: Seepage sheds occupied by this species should be prioritized for conservation. Use watersheds as a proxy if seepage patterns are unknown. Minimize groundwater withdrawls and nutrient applications within these areas.

Objective: Incorporate the seepage sheds into conservation plans of municipalities, counties, and local land trusts.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of plans that incorporate conservation of these seepage sheds

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Township Zoning Boards

Locations: Physiographic Province: Central Lowlands, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Ridge and Valley, Piedmont, Piedmont, Piedmont, Piedmont, Piedmont, Appalachian Plateaus, Ridge and Valley. Physiographic Section: Eastern Lake, Pittsburgh Low Plateau, High Plateau, Appalachian Mountain, Great Valley, Piedmont Upland, Piedmont Lowland, Gettysburg-Newark Lowland, Piedmont Upland, Gettysburg-Newark Lowland, Glaciated Low Plateau, Anthracite Upland

Other species likely to benefit from this action: Seepage Dancer (Argia bipunctulata), Brown Spiketail (Cordulegaster bilineata), Tiger Spiketail (Cordulegaster erronea), River Bluet (Enallagma anna), Forcipate Emerald (Somatochlora forcipata), Brush-tipped Emerald (Somatochlora walshii)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Brush-tipped Emerald

Somatochlora walshii

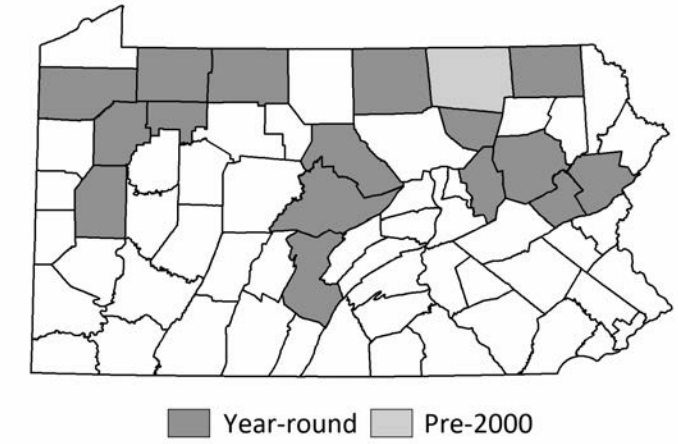
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Koval

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Small, clear, slow-flowing wetland streams.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Medium - Low

Specific Threat: Lowering of groundwater levels, caused by withdrawals for residential/commercial/agricultural use, dry up spring and seep habitats.

Action Category: Conservation planning

Specific Action: Seepage sheds occupied by this species should be prioritized for conservation. Use watersheds as a proxy if seepage patterns are unknown. Minimize groundwater withdrawls and nutrient applications within these areas.

Objective: Incorporate the seepage sheds into conservation plans of municipalities, counties, and local land trusts.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of plans that incorporate conservation of these seepage sheds

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Township Zoning Boards

Locations: Physiographic Section: Northwestern Glaciated Plateau, High Plateau, Deep Valleys, Appalachian Mountain, Pittsburgh Low Plateau, Glaciated Pocono Plateau, Glaciated Low Plateau, Glaciated High Plateau, Glaciated High Plateau, Glaciated High Plateau

Other species likely to benefit from this action: Seepage Dancer (Argia bipunctulata), Brown Spiketail (Cordulegaster bilineata), Tiger Spiketail (Cordulegaster erronea), River Bluet (Enallagma anna), Forcipate Emerald (Somatochlora forcipata), Gray Petaltail (Tachopteryx thoreyi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Williamson's Emerald

Somatochlora williamsoni

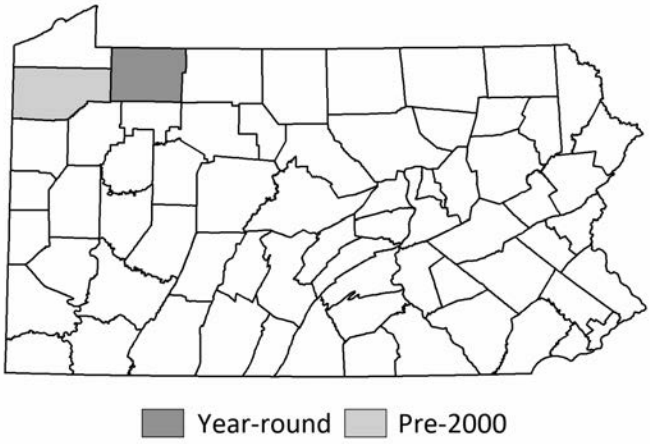
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



K. Grace

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain populations at current levels through 2035

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Shaded streams and boggy-edged ponds.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Temperature Extremes

Threat Impact: Medium

Specific Threat: The appropriate climate envelope for this species is shifting north and out of Pennsylvania. Other climate-related factors, such as changing hydrologic regime, are likely to be operating as well.

Action Category: Conservation planning

Specific Action: Incorporate odonates and other aquatic invertebrates into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate change mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: A compilation of best practices related to climate change mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: River Jewelwing (Calopteryx aequabilis), Taiga Bluet (Coenagrion resolutum), Petite Emerald (Dorocordulia lepida), New England Bluet (Enallagma laterale), Spiny Baskettail (Epitheca spinigera), and Extra-striped Snaketail (Ophiogomphus anomalus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Sable Clubtail

Stenogomphurus rogersi

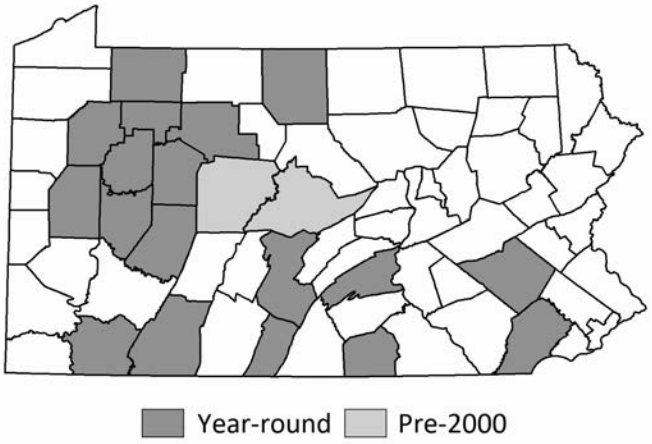
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Forested, clear-flowing streams, usually small, rocky, and with alternating pools and riffles.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Commercial and Industrial Areas **Threat Impact:** Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Department of Community & Economic Development

Locations: HUC8 Watershed: Mid. Allegheny-Tionesta, Connoquenessing, U. Allegheny, Conewango, Mid. Allegheny-Redbank, Conemaugh, Youghiogheny, U. Juniata, Lower Juniata, Lower Susquehanna-Swatara, Schuylkill

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons))

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Riverine Clubtail

Stylurus amnicola

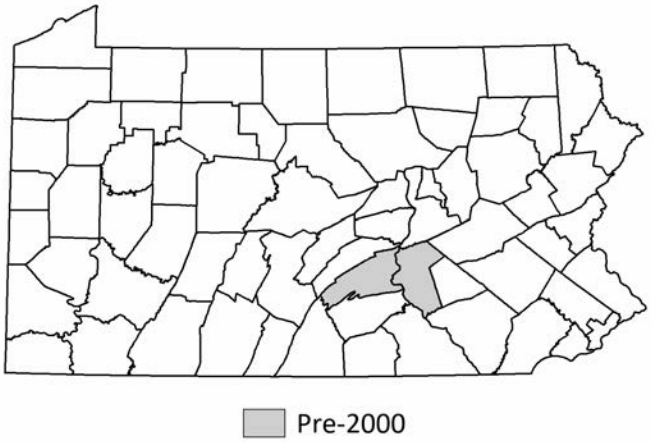
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Shively

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Improve habitat quality to facilitate the return of this species to Pennsylvania.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Fast-flowing medium to large rivers with sandy, gravel, or mud bottoms.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Stormwater runoff, adding sediment and other pollution to streams

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Susquehanna River Basin Commission, Township Zoning Boards

Locations: HUC6 Watershed: Lower Susquehanna

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Elusive Clubtail

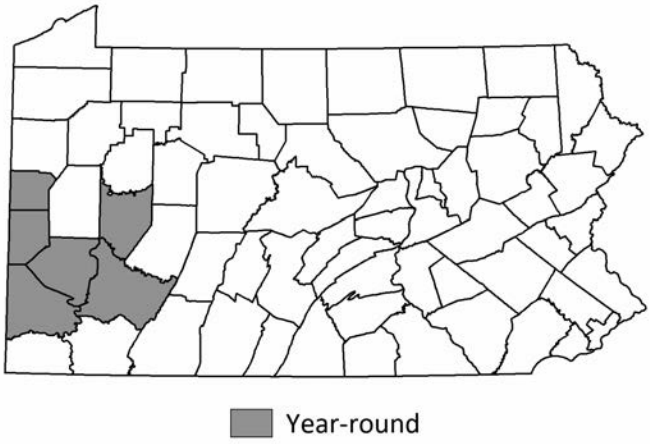
Stylurus notatus

Pete Woods *Western Pennsylvania Conservancy*



D. Tibbetts

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035

NatureServe Global Rank: G3

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Large, sandy rivers and lakes.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Stormwater runoff, adding sediment and other pollution to streams

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Private Landowners

Locations: HUC8 Watershed: Beaver, U. Ohio, Lower Allegheny, Lower Monongahela

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Russet-tipped Clubtail

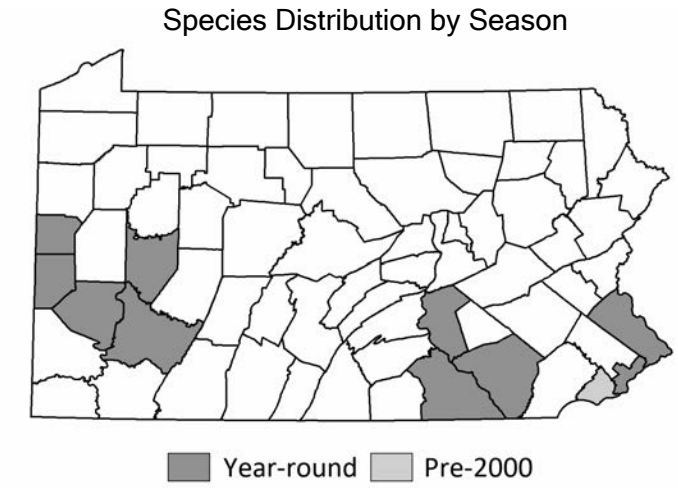
Stylurus plagiatus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Meyers



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Slow-flowing freshwater tidal creeks, silty lakes, and anthropogenic habitats with fluctuating water levels (e.g., dammed reservoirs).

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Stormwater runoff, adding sediment and other pollution to streams

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Environmental Protection, Private Landowners, Susquehanna River Basin Commission

Locations: Physiographic Province: Appalachian Plateaus, Ridge and Valley, Piedmont, Piedmont, Piedmont, Piedmont, Piedmont, Piedmont, Atlantic Coastal Plain. Physiographic Section: Pittsburgh Low Plateau, Great Valley, Gettysburg-Newark Lowland, Piedmont Lowland, Piedmont Upland, Piedmont Lowland, Piedmont Upland, Piedmont Lowland, Lowland and Intermediate Upland. HUC8 Watershed: Beaver, U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Zebra Clubtail

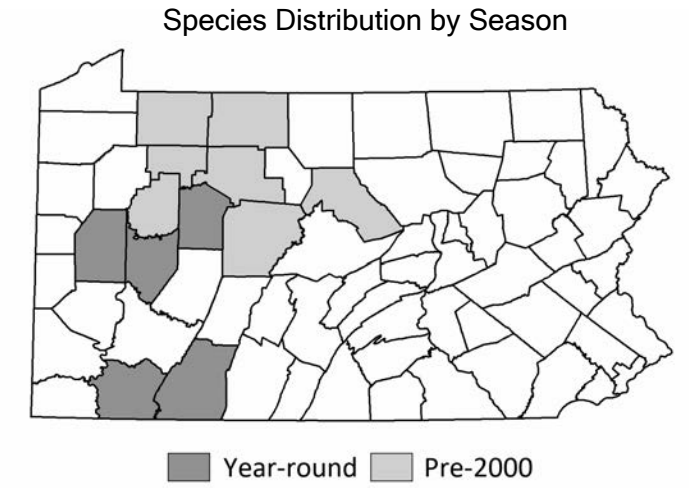
Stylurus scudderi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



S. Tobin



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations, and improve our knowledge of the species' distribution

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Fast-flowing, clear, forested streams and rivers, usually rocky or sandy-bottomed.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Low

Specific Threat: Sediment and other pollution, coming from plowed fields

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Community & Economic Development, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC4 Watershed: Allegheny, Monongahela

Other species likely to benefit from this action: Sable Clubtail (Stenogomphurus rogersi), Spine-crowned Clubtail (Hylogomphus abbreviatus), Riffle Snaketail (Ophiogomphus carolus), Appalachian Snaketail (Ophiogomphus incurvatus), Maine Snaketail (Ophiogomphus mainensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Blue-faced Meadowhawk

Sympetrum ambiguum

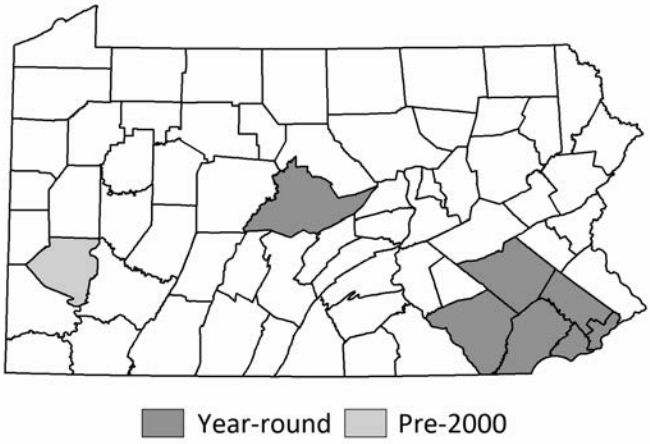
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



K. Howe

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Woodland ponds or floodplains.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore or maintain well-vegetated buffers around ponds and lakes.

Objective: Increase by 10% over 10 years, the forested or vegetative cover around water bodies currently and formerly inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Agriculture, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Brandywine-Christina, Chester-Sassafras, Lower Susquehanna, Schuylkill, Crosswicks-Neshaminy, Lower Delaware, Bald Eagle

Other species likely to benefit from this action: Little Blue Dragonlet (Erythrodiplax minuscula), Martha's Pennant (Celithemis martha), Seaside Dragonlet (Erythrodiplax berenice), Slender Baskettail (Epitheca costalis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Saffron-winged Meadowhawk

Sympetrum costiferum

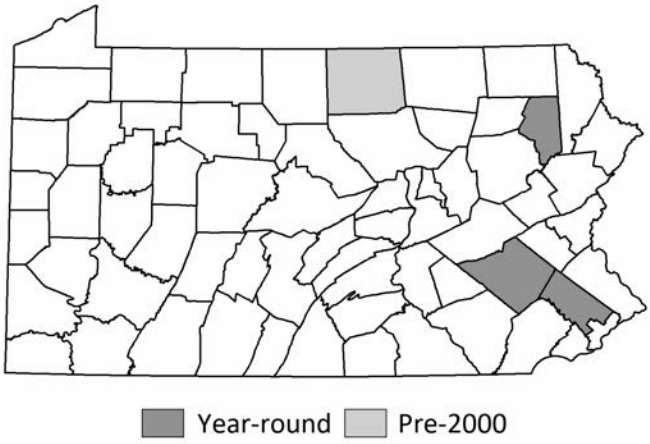
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Hibbits

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain populations at current levels through 2025

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Ponds, lakes, acidic and brackish wetlands; sites often with sandy or gravelly substrates.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Temperature Extremes **Threat Impact:** Medium

Specific Threat: The appropriate climate envelope for this species is shifting north and out of Pennsylvania. Other climate-related factors, such as changing hydrologic regime, are likely to be operating as well.

Action Category: Conservation planning

Specific Action: Incorporate odonates and other aquatic invertebrates into climate mitigation and resiliency planning for wildlife. Consider life history, habitat requirements and corridors for species limited to northern latitudes, high elevations, and other sensitive habitats in Pennsylvania that are expected to be most impacted by changing climate. Also incorporate strategies to protect and facilitate movement of species into Pennsylvania. Identify existing and needed frameworks for monitoring species, sensitive habitats, and local climate change velocities.

Objective: Develop climate change mitigation and resiliency best practices for invertebrates that can be incorporated into species, habitat and landscape-level conservation plans.

Action Priority: 3-Medium

Action Urgency: Initiate within 5-10 years

Measure: A compilation of best practices related to climate change mitigation and resiliency for invertebrates based on species guilds and habitat associations

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission

Locations: Statewide

Other species likely to benefit from this action: River Jewelwing (Calopteryx aequabilis), Taiga Bluet (Coenagrion resolutum), Petite Emerald (Dorocordulia lepida), New England Bluet (Enallagma laterale), Spiny Baskettail (Epitheca spinigera), and Extra-striped Snaketail (Ophiogomphus anomalus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Gray Petaltail

Tachopteryx thoreyi

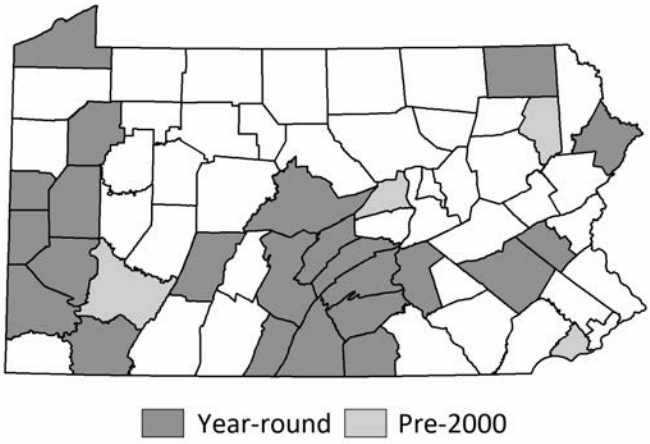
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current populations through 2035, and improve our knowledge about the species' distribution.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Woodland seeps, sandy streams, and small fens.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Medium - Low

Specific Threat: Lowering of groundwater levels, caused by withdrawals for residential/commercial/agricultural use, dry up spring and seep habitats.

Action Category: Conservation planning

Specific Action: Seepage sheds occupied by this species should be prioritized for conservation. Use watersheds as a proxy if seepage patterns are unknown. Minimize groundwater withdrawls and nutrient applications within these areas.

Objective: Incorporate the seepage sheds into conservation plans of municipalities, counties, and local land trusts.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of plans that incorporate conservation of these seepage sheds

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Township Zoning Boards

Locations: Physiographic Section: Pittsburgh Low Plateau, High Plateau, Allegheny Mountain, Appalachian Mountain, Allegheny Front, Glaciated Low Plateau, Great Valley

Other species likely to benefit from this action: Seepage Dancer (Argia bipunctulata), Brown Spiketail (Cordulegaster bilineata), Tiger Spiketail (Cordulegaster erronea), River Bluet (Enallagma anna), Forcipate Emerald (Somatochlora forcipata), Brush-tipped Emerald (Somatochlora walshii)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Lyre-tipped Spreadwing

Lestes unguiculatus

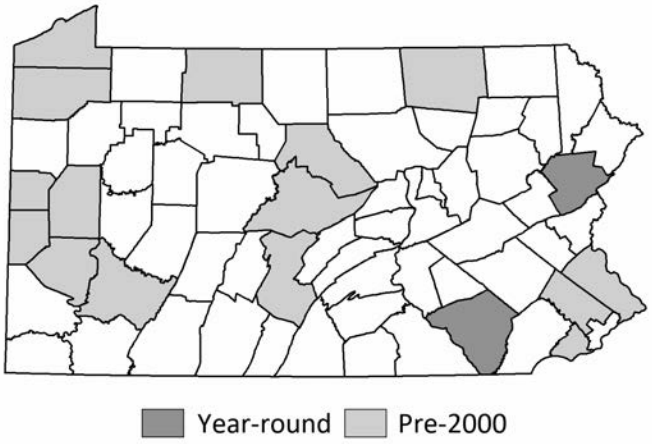
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: temporary ponds, shallow marshes, and slow streams.

Primary Habitat: Palustrine

Primary Habitat Type: Vernal Pools/Ephemeral Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Medium - Low

Specific Threat: Stormwater runoff, contributing sediment and other pollution to waterways

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Private Landowners, Susquehanna River Basin Commission

Locations: HUC8 Watershed: Lower Susquehanna, Mid. Delaware-Mongaup-Brodhead, Lehigh, Schuylkill, Mid. Delaware-Musconetcong

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Georgia River Cruiser

Macromia illinoiensis georgina

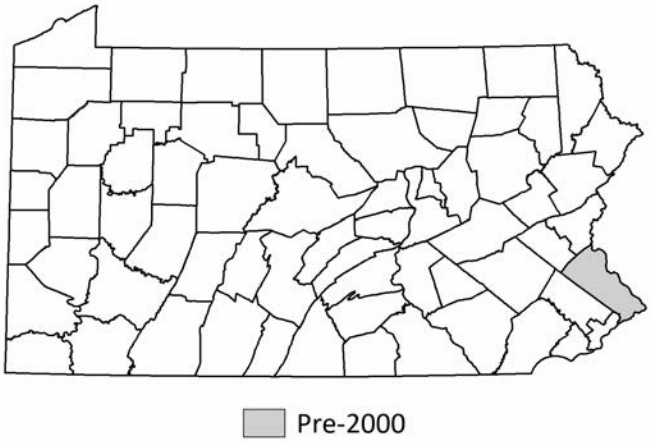
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



C. Shiffer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5T5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: large streams, rivers

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Stormwater runoff, adding sediment and other pollution to streams

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Delaware River Basin Commission, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Private Landowners, Township Zoning Boards

Locations: HUC6 Watershed: U. Delaware

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Umber Shadowdragon

Neurocordulia obsoleta

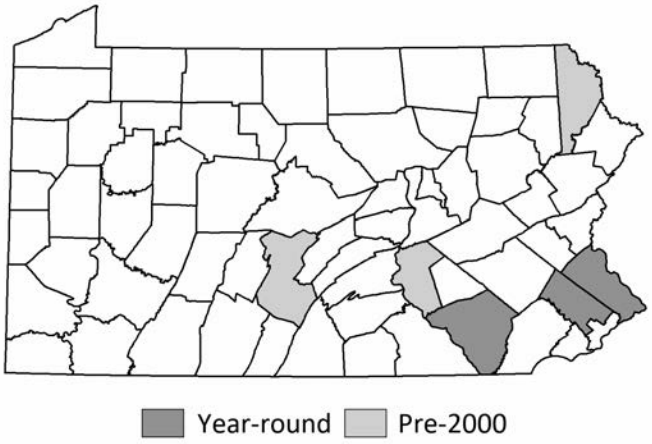
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Coin

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: clear streams, large rivers, and lakes

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Roads and Railroads **Threat Impact:** Low

Specific Threat: Stormwater runoff, adding sediment and other pollution to streams

Action Category: Manage non-living habitat components

Specific Action: Use green infrastructure to reduce storm water volume.

Objective: Increase the use of permeable surfaces for new construction, and the replacement of impermeable surfaces with permeable ones, in the watersheds occupied by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Reduction in impermeable surfaces.

Potential Collaborators: Businesses, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners

Locations: Physiographic Province: Piedmont, Piedmont. Physiographic Section: Piedmont Upland, Gettysburg-Newark Lowland. HUC4 Watershed: Susquehanna, Delaware-Mid Atlantic Coastal. HUC6 Watershed: Lower Susquehanna, U. Delaware

Other species likely to benefit from this action: Appalachian Jewelwing (Calopteryx angustipennis), Sparkling Jewelwing (Calopteryx dimidiata), Septima's Clubtail (Gomphurus septima delawarensis), Uhler's Sundragon (Helocordulia uhleri), Green-faced Clubtail (Hylogomphus viridifrons), and Allegheny River Cruiser (Macromia alleghaniensis)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Appalachian Grasshopper

Appalachia hebardi

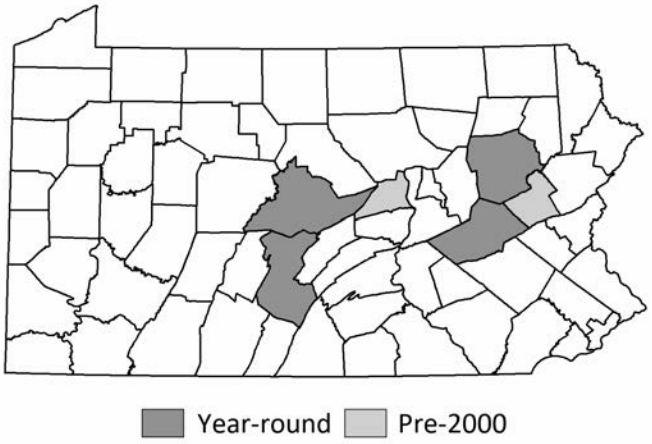
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



N. Gilchenok

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G1

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Open habitats on ridgetops

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium - Low

Specific Threat: Fire suppression on xeric ridgetops results in succession to forest.

Action Category: Manage non-living habitat components

Specific Action: Consider using fire or other vegetation suppression to open up ridgetop habitat near occurrences.

Objective: Evaluate habitat at all known occurrences (3 at the time of this writing) to determine management needs. Incorporate occurrences into site managment.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of occurrences evaluated

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Game Commission

Locations: Physiographic Province: Ridge and Valley

Other species likely to benefit from this action: other invertebrates that depend on barrens

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Seaside Grasshopper

Trimerotropis maritima

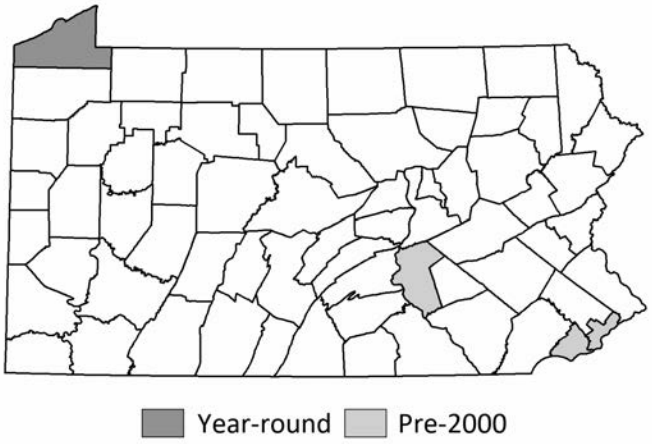
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



F. Kynd

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: sandy beaches, dunes, and sandplain habitat.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Beaches & Dunes

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Recreational Activities **Threat Impact:** Low

Specific Threat: Foot traffic and other disturbances may impact occupied habitat, especially at beaches 10 and 11. Gull Point is fairly safe from foot disturbance due to the breeding shorebird restrictions.

Action Category: Other legal actions

Specific Action: Maintain policies of keeping people off Piping Plover habitat (ie, Gull Point) during the breeding season. This will protect other sand barren specialist species that are vulnerable to foot traffic.

Objective: Minimize effects of foot traffic on most parts of Gull Point.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Occupancy of various segments of beach.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, U.S. Fish and Wildlife Service

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Sphagnum Ground Cricket

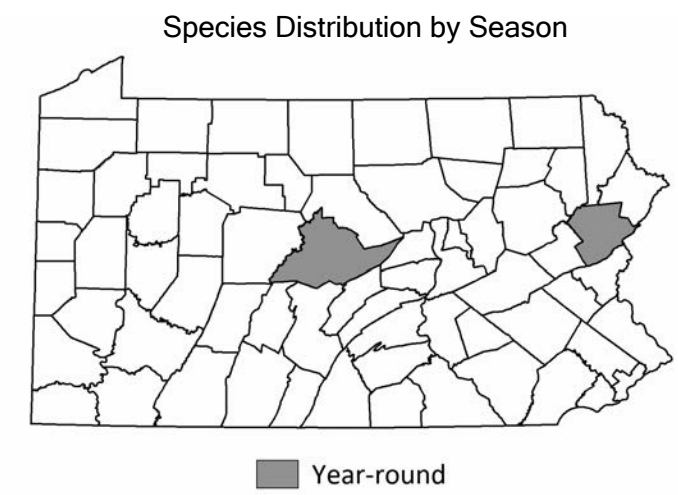
Neonemobius palustris

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



R. Glos



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: sphagnum bogs

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: North-Central Interior and Appalachian Acidic Peatland

Season: Year-round

Threat Category: Other Ecosystem Modifications **Threat Impact:** Low

Specific Threat: Loss of bog habitats due to conversion, fragmentation, or eutrophication.

Action Category: Conserve specific land or seascapes

Specific Action: Protect bogs by purchase or easement.

Objective: Identify and prioritize bogs for protections. Pursue protection options at high priority sites.

Action Priority: 3-Medium **Action Urgency:** **Measure:** number of bogs with increased protection

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Appalachian Plateaus, Ridge and Valley, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Ridge and Valley, Ridge and Valley, Ridge and Valley. Physiographic Section: Northwestern Glaciated Plateau, High Plateau, Deep Valleys, Glaciated High Plateau, Glaciated Low Plateau, Glaciated High Plateau, Anthracite Valley, Glaciated Pocono Plateau, Appalachian Mountain, Allegheny Front, Pittsburgh Low Plateau, Susquehanna Lowland, Anthracite Upland, Blue Mountain, Great Valley

Other species likely to benefit from this action: Small Brocade Moth (Oligia minuscula) Elfin Skimmer (Nannothemis bellis) Bog Copper (Tharsalea epixanthe) Sphagnum Ground Cricket (Neonemobius palustris) Darlington's Harp Ground Beetle (Agonum darlingtoni)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Longhorn Band-wing Grasshopper

Psinidia fenestralis

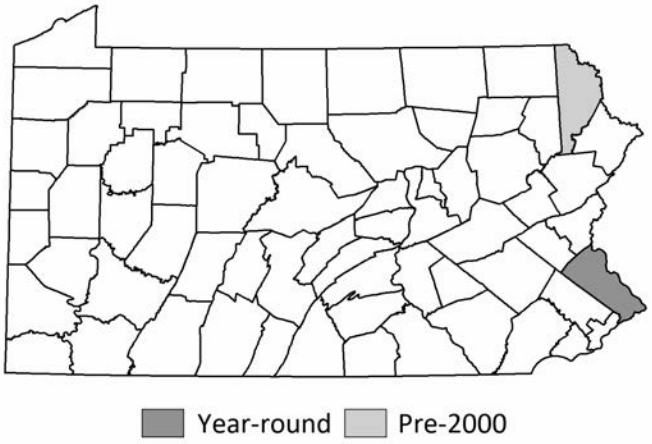
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



D. Ricci

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain the one known population; Improve our knowledge of this species' distribution and conservation needs.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: open sandy habitats.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium - Low

Specific Threat: A lack of fire and other disturbance at the open sandy habitat in the one known population could result in succession of the site to shrubland/woodland.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Introduce a disturbance regime (could be fire, herbicide, or other disturbance) at the open sand habitat at Neshaminy State Park to keep the habitat open.

Objective: Within 5 years, evaluate the habitat and incorporate a periodic disturbance regime into the park management plan. Implement the disturbance regime.

Action Priority: 4-Low **Action Urgency:** Initiate within 5 years **Measure:** Acres kept open.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources

Locations: HUC8 Watershed: Crosswicks-Neshaminy

Other species likely to benefit from this action: There are likely other species of concern at the site that would benefit from this action.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys are needed to determine the area occupied by the grasshopper. Other invertebrate surveys should be conducted to determine what other specialists of sandy habitats are present.	Pennsylvania Department of Conservation and Natural Resources

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Fringetree Lace Bug

Leptoypha mutica

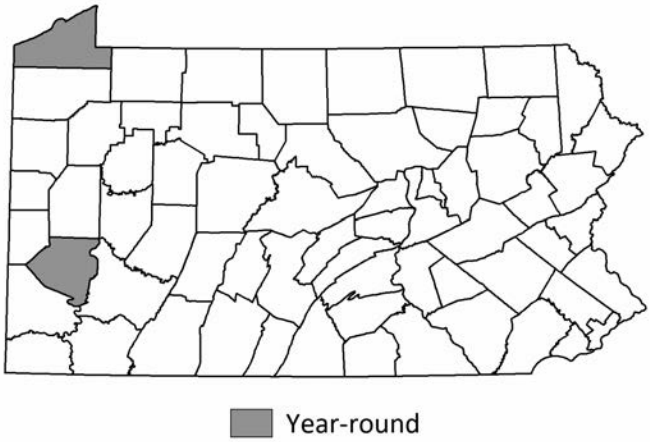
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



M. Fawver

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species from Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-80%

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Uses white ash (Fraxinus americana), fringetree (Chionanthus virginicus), and possibly other ashes (Fraxinus spp.)

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. This species is still extant, presumably persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents in large stands of ash (Fraxinus spp.) across the state.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

Season: Year-round

Priority	Survey	Partners
4	Conduct surveys for this species on native populations of Fringetree (Chionanthus virginica), to determine if it is able to survive in the absence of Fraxinus.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

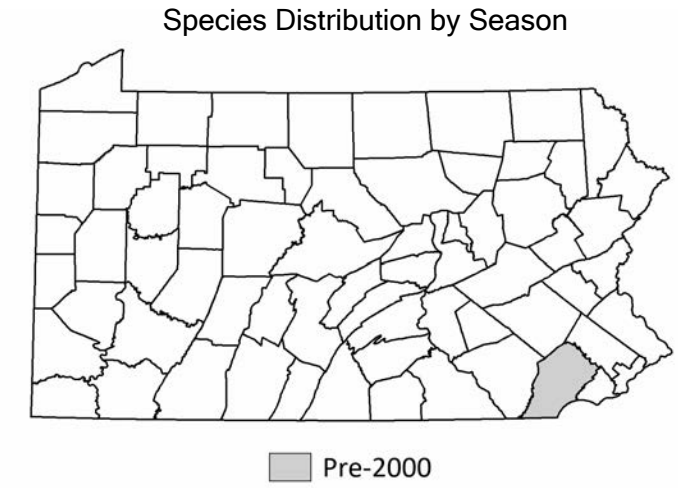
A dirt-colored seed bug

Eremocoris depressus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Improve our knowledge of the distribution of this species by searching for this bug in pine barrens habitats throughout the state.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of >10%

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: This species reproduces in 2nd year pine cones of pitch pine (Pinus rigida), and is a characteristic species of pitch pine barrens. North and east of PA, only pitch pine is used, while south of PA there are also records on Virginia pine and table mountain pine.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Problematic Native Species/Diseases

Threat Impact: Very High - Medium

Specific Threat: Southern pine beetle (Dendroctonus frontalis) has devastated the host plant population at the only known site. There is a good possibility of presence at other sites, but the southern pine beetle is likely to keep moving north with climate change, and all/any site may eventually be threatened (but probably not within a 10-year time frame).

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Thin pitch pine stands, and follow other best practices as described by the USFS, to reduce susceptibility to southern pine beetle.

Objective: Identify pitch pine barrens in southeast PA that are most susceptible to southern pine beetle, and manage those stands to minimize risk from the beetle.

Action Priority: 3-Medium

Action Urgency: Initiate immediately

Measure: Acres thinned or otherwise managed.

Potential Collaborators: U.S. Fish and Wildlife Service

Locations: Physiographic Province: Piedmont

Other species likely to benefit from this action: Slaterobius quadristriatus and Xylotrechus schaefferi are rare beetles that also specialize on pitch pines. They are not yet known from Pennsylvania but could potentially be here.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

New Jersey Tea Lacebug

Gargaphia angulata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Open, well-drained sites with poor soils

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Central Appalachian Pine-Oak Rocky Woodland

Season: Year-round

Threat Category: Problematic Native Species/Diseases

Threat Impact: Very High - High

Specific Threat: Ceanothus americana is a favorite food of white-tail deer, and overbrowsing by deer has contributed to the decline of the plant. The plant is not quite rare in PA, but very few populations are large enough to sustain a population of specialist insects.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Install deer fencing around those populations of New Jersey Tea that are known to support specialist herbivores. If data is lacking, assume that larger populations harbor at least one of the SGCN specialists.

Objective: Protect 10 populations of New Jersey Tea with deer exclosures

Action Priority: 2-High

Action Urgency: Initiate within 5 years

Measure: Number and area of exclosures built; change in area of New Jersey Tea colony

Potential Collaborators: Local agencies & municipalities, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulate) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** High - Low

Specific Threat: Many, perhaps most, of the remaining populations of Ceanothus americana are on rights-of-way. Indiscriminant use of herbicide by workers who do not distinguish between different kinds of woody plants is a threat.

Action Category: Outreach, communication and distribution

Specific Action: Work with electric and gas ROW managers, and with landowners, to protect populations of New Jersey Tea (Ceanothus americanus), Wild Indigo (Baptisia tinctoria), and Sundial Lupine (Lupinus perennis) that are vulnerable to ROW management practices.

Objective: Identify populations of these plants on ROWs, and prioritize populations of each species by population size/area and by known presence of target invertebrate specialist species. Get landowners and managers to agree on management plans for each site.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of plans written.

Potential Collaborators: Businesses, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulata) New Jersey Tea Leafroller Moth (Filatima n. sp.)

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** High - Low

Specific Threat: Fire suppression over the last century may have contributed to the decline of the host plant Ceanothus americana in PA. This bug, however, is probably not able to survive fires, so the habitat must be burned in patches, over time, to allow recolonization from unburned areas.

Action Category: Manage non-living habitat components

Specific Action: When conducting prescribed burns on state lands, identify New Jersey Tea stands within the project area, and incorporate them into the project planning.

Objective: Conduct the burning in patches to ensure that no more than 25% of the New Jersey Tea plants are disturbed by any one round of disturbance, and allow several years for recovery before additional patches of the plant are disturbed.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of burn projects containing New Jersey Tea. Percent of New Jersey Tea plants burned by each of those projects.

Potential Collaborators: Non-governmental organizations, Pennsylvania Game Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on New Jersey Tea and would benefit from this action: a tortricid moth (Ancylis semiovana) Poor Miner Bee (Protandrena pauper) New Jersey Tea Inchworm (Apodrepanulatrix liberaria) Mottled Duskywing (Erynnis martialis) New Jersey Tea Lace Bug (Gargaphia angulata) New Jersey Tea Leafroller Moth (Filatima n. sp.)

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Surveys for the six New Jersey Tea specialist SGCN should be conducted where medium to large patches of New Jersey Tea are found. Presence of one of these species is evidence that the patch may be large and stable enough to support some of the other species.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A treehopper

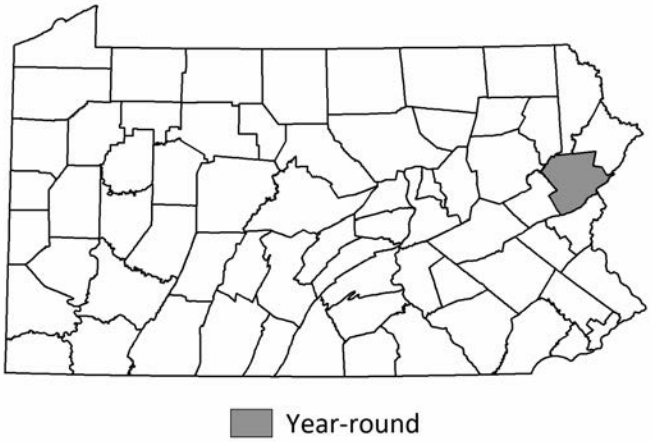
Glossonotus nimbatulus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the species' distribution in Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: This is a specialist on scrub oak (Quercus ilicifolia), and it occurs in scrub oak barrens.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium

Specific Threat: Fire suppression is the main threat to scrub oak barrens in PA. Burning habitats in patches over time is critical; all life stages of this treehopper are vulnerable to fire, so preservation of habitat patches as recolonization sources is critical when burning.

Action Category: Manage non-living habitat components

Specific Action: Manage scrub oak barrens habitats with prescribed burns. Be careful to burn in patches, and spread out the burning of each site over many years, so that there is always a mix of young, medium, and older stands.

Objective: Explicitly incorporate the needs of invertebrate SGCN into prescribed burn plans on state land.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** number of burns with patch size and timing appropriate for invertebrate conservation

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Physiographic Province: Appalachian Plateaus, Ridge and Valley

Other species likely to benefit from this action: Woods Underwing Moth (Catocala sp. 1 near jair) Trembling Sallow Moth (Chaetoglaea rhomba) Spiny Oakworm Moth (Anisota stigma) Waxed Sallow Moth (Chaetoglaea serrata) a noctuid moth (Feltia manifesta

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Wild Indigo Lace Bug

Leptopharsa heidemanni

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of this species' distribution

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: open xeric habitats with Yellow Wild Indigo (Baptisia tinctoria)

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Utility and Service Lines **Threat Impact:** High - Low

Specific Threat: Rights-of-way are important habitats for the host plant. Wild Indigo is vulnerable to ROW management practices such as indiscriminant herbicide spraying.

Action Category: Outreach, communication and distribution

Specific Action: Work with electric and gas ROW managers, and with landowners, to protect populations of New Jersey Tea (Ceanothus americanus), Wild Indigo (Baptisia tinctoria), and Sundial Lupine (Lupinus perennis) that are vulnerable to ROW management practices.

Objective: Identify populations of these plants on ROWs, and prioritize populations of each species by population size/area and by known presence of target invertebrate specialist species. Get landowners and managers to agree on management plans for each site.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of plans written.

Potential Collaborators: Businesses, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Private Landowners

Locations: Statewide

Other species likely to benefit from this action: The following species are all specialists on Yellow Wild Indigo and would benefit from this action: Baptisia Seedpod Weevil (Apion rostrum), A leafminer fly (Liriomyza baptisiae), A lace bug (Leptopharsa heidemanni), Lupine Leafroller Moth (Anacampsis lupinella), Three-lined Grapholita (Grapholita tristrigana), A pyralid moth (Pococera baptisiella), Pearly Indigo Borer (Sitochroa dasconalis), Genista Broom Moth (Uresiphita reversalis)

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium - Low

Specific Threat: Fire suppression is the main reason why the host plants are much less common than they once were in PA. Burning habitats in patches over time is probably critical; this species is probably not able to survive fire, so preservation of habitat patches as recolonization sources is critical when burning.

Action Category: Manage non-living habitat components

Specific Action: When conducting prescribed burns on state lands, identify Yellow Wild Indigo (Baptisia tinctoria) stands within the project area, and incorporate them into the project planning.

Objective: Conduct the burning in patches to ensure that no more than 25% of the Yellow False Indigo plants are disturbed by any one round of disturbance, and allow several years for recovery before additional patches of the plant are disturbed.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of burn projects that take Yellow Wild Indigo into consideration. Percent of Yellow False Indigo plants burned by each of those projects.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Frosted Elfin (Callophrys irus), Baptisia Seedpod Weevil (Apion rostrum), A leafminer fly (Liriomyza baptisiae), A lace bug (Leptopharsa heidemanni), Lupine Leafroller Moth (Anacampsis lupinella), Three-lined Grapholita (Grapholita tristrigana), A pyralid moth (Pococera baptisiella), Pearly Indigo Borer (Sitochroa dasconalis), Genista Broom Moth (Uresiphita reversalis),

No known research needs.

Season: Year-round

Priority	Survey	Partners
4	Surveys are needed across Pennsylvania to determine the distribution of this species.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Dwarf Wedgemussel

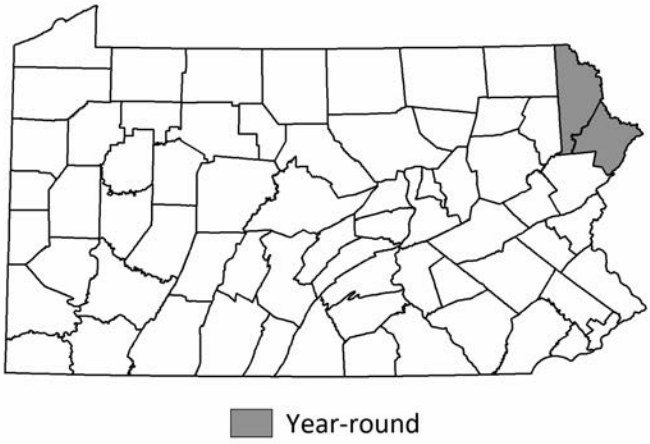
Prolasmidonta heterodon

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



N. Welte, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Dwarf Wedgemussel in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G2

IUCN Red List Designation: Vulnerable

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Endangered

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Known Dwarf Wedgemussel populations are associated with cool/cold groundwater in-river upwellings (e.g., springs). Appropriate temperatures and flows are and will be necessary to maintain the Delaware River Dwarf Wedgemussel population.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Small River

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Medium

Specific Threat: Variable and low flows in the upper Delaware River risk Dwarf Wedgemussel populations by reducing wetted width at known locations.

Action Category: Manage non-living habitat components

Specific Action: Manage Delaware River mainstem flows in a manner that sustains, maintains, or allows expansion of existing Dwarf Wedgemussel populations.

Objective: Maintain hydrologic management regime that retains a minimum wetted widths necessary to sustain Dwarf Wedgemussel populations.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Wetted widths as known Dwarf Wedgemussel locations maintained 100% of the time.

Potential Collaborators: Delaware River Basin Commission, Local agencies & municipalities, Other federal agency, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: U. Delaware, Mid. Delaware-Mongaup-Brodhead, Mid. Delaware-Musconetcong

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** Very High - Medium

Specific Threat: Reduction of wetted habitat or shifting of occupied habitat due to climate change-driven droughts and/or floods paired with increased water temperatures and erosion.

Action Category: Manage non-living habitat components

Specific Action: Manage upper Delaware River water temperatures to address climate change water temperature changes.

Objective: Maintain water temperatures within Dwarf Wedgemussel thermal optimum.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Water temperatures at Dwarf Wedgemussel sites maintained within identified thermal optimums 100% of the time.

Potential Collaborators: Delaware River Basin Commission, Other federal agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, U.S. Geological Survey, Universities & research institutions

Locations: HUC8 Watershed: Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead, U. Delaware

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** Medium

Specific Threat: Risk of a waste treatment plant malfunction, increase in discharge or certain discharge constituents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed wastewater discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Dwarf Wedgemussel conflicts or known locations.

Potential Collaborators: Businesses, Other federal agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Delaware, Mid. Delaware-Mongaup-Brodhead, Mid. Delaware-Musconetcong

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** Medium

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Dwarf Wedgemussel conflicts or known locations.

Potential Collaborators: Businesses, Delaware River Basin Commission, Other federal agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Delaware, Mid. Delaware-Mongaup-Brodhead, Mid. Delaware-Musconetcong

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Model future status and distribution potential of Delaware River Dwarf Wedgemussel population.	Delaware River Basin Commission, U.S. Geological Survey, U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Other federal agency
2	Research anticipated climate change effects on upper Delaware River fish and mussel fauna.	U.S. Geological Survey, U.S. Fish and Wildlife Service, Universities & research institutions, Delaware River Basin Commission, Other federal agency
3	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan. Assist PFBC with Pennsylvania-specific species recovery goals outlined in Species Action Plans.	Conservancies & Land Trusts, Delaware River Basin Commission, Non-governmental organizations, Other federal agency, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, U.S. Geological Survey
4	Collaborate with partners on species genetics projects.	U.S. Geological Survey, U.S. Fish and Wildlife Service, Universities & research institutions, Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations

Season: Year-round

Priority	Survey	Partners
1	Conduct mussel surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas. Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, U.S. Geological Survey, Non-governmental organizations, Other federal agency
2	Address data gaps in the Delaware River and its tributaries from the Delaware Water Gap downstream to the head of tide. Update upper Delaware survey data (Hancock, NY to Delaware Water Gap).	Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Other federal agency, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, U.S. Geological Survey, Non-governmental organizations

Name: Dwarf Wedgemussel restoration monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Name: Dwarf Wedgemussel status monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

Cole, J.C., Townsend, P.A., and K.N. Eshleman. 2008. Predicting flow and temperature regimes at three Alasmidonta heterodon locations in the Delaware River. Technical Report NPS/NER/NRTR - 2008/109. National Park Service, Philadelphia, PA.

Pennsylvania Fish and Boat Commission. 2022. Climate Action Plan: Strategies for enhancing climate adaptation and resilience to protect, conserve, and enhance Pennsylvania's aquatic resources and support anglers and boaters, version 2022-1.0. Harrisburg, Pennsylvania.

PFBC. 2025. Species Action Plan: Dwarf Wedgemussel (Alasmidonta heterodon).

U.S. Fish and Wildlife Service. 1993. Dwarf Wedge Mussel (Alasmidonta heterodon) Recovery Plan. Hadley, Massachusetts.

White, B.S.J. 2007. Evaluation of fish host suitability for the endangered Dwarf Wedgemussel, Alasmidonta heterodon. Thesis. The Pennsylvania State University, College of Agricultural Science, State College, PA.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Triangle Floater

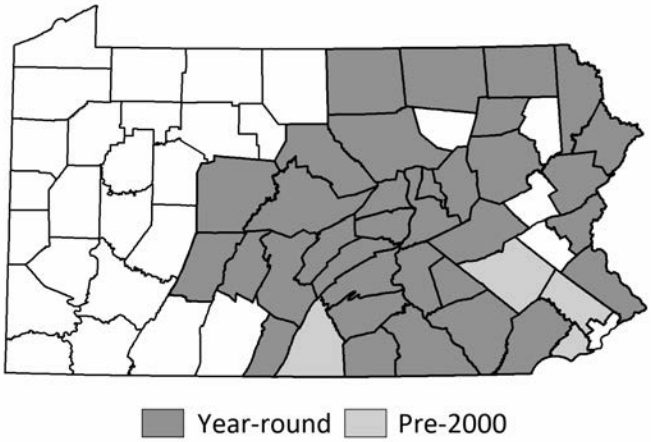
Alasmidonta undulata

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: HUC8 Watershed: Lower Susquehanna, Lower Susquehanna-Swatara, Conococheague-Opequon, Lower Juniata, U. Juniata, Bald Eagle, Lower Susquehanna-Penns, Lower W. Br. Susquehanna, U. Susquehanna-Lackawanna, Schuylkill, Brandywine-Christina, Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead, Lehigh, Lackawaxen, U. Delaware, U. Susquehanna, U. Susquehanna-Tunkhannock, Owego-Wappasening, Chemung, Tioga, Pine, Mid. W. Br. Susquehanna, Sinnemahoning, U. W. Br. Susquehanna

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Low

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Triangle Floater conflicts or known locations.

Potential Collaborators: Businesses, Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

Locations: HUC8 Watershed: U. Delaware, U. Susquehanna, Owego-Wappasening, Chemung, U. Susquehanna-Tunkhannock, Tioga, Pine, Mid. W. Br. Susquehanna, Sinnemahoning, U. W. Br. Susquehanna, U. Juniata, Raystown, Cacapon-Town, N. Br. Potomac, Conococheague-Opequon, Lower Juniata, Lower Susquehanna-Swatara, Lower Susquehanna, Brandywine-Christina, Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Schuylkill, Lower Susquehanna-Penns, U. Susquehanna-Lackawanna, Lehigh, Mid. Delaware-Mongaup-Brodhead, Lackawaxen, U. Susquehanna-Tunkhannock, U. Delaware

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Triangle Floater and other members of the Alasmidonta genus. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct Delaware, Potomac, and Susquehanna River basin surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Delaware River Basin Commission, Susquehanna River Basin Commission, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection

Name: Triangle Floater status monitoring **Lead(s) :** PFBC

Link: N/A

Description: Monitor species strongholds to establish baseline species status for trend analysis.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Brook Floater

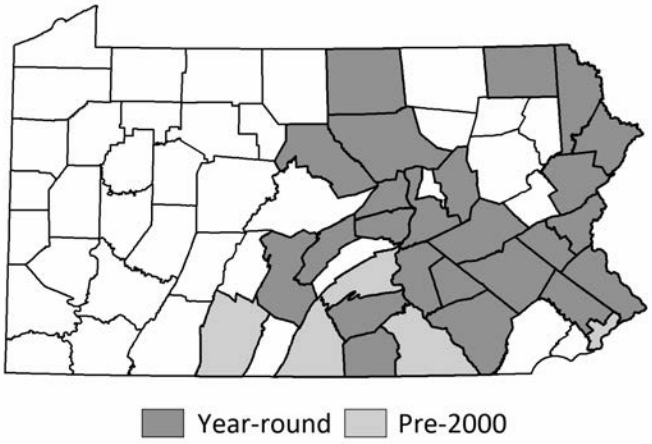
Alasmidonta varicosa

Nevin T. Welte — *Pennsylvania Fish and Boat Commission*



M. Walsh, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G3

IUCN Red List Designation: Vulnerable

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Small River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: HUC8 Watershed: Conococheague-Opequon, Raystown, U. Juniata, U. W. Br. Susquehanna, Sinnemahoning, Mid. W. Br. Susquehanna, Pine, Tioga, Lower W. Br. Susquehanna, U. Susquehanna-Tunkhannock, Chemung, Owego-Wappasening, U. Susquehanna, U. Delaware, Mid. Delaware-Mongaup-Brodhead, Lackawaxen, U. Susquehanna-Lackawanna, Lehigh, Mid. Delaware-Musconetcong, Crosswicks-Neshaminy, Lower Delaware, Schuylkill, Lower Susquehanna, Monocacy, Lower Susquehanna-Swatara, Lower Juniata, Lower Susquehanna-Penns, Brandywine-Christina

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** High - Low

Specific Threat: Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed wastewater discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Brook Floater conflicts or known locations.

Potential Collaborators: Businesses, Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Conococheague-Opequon, Cacapon-Town, N. Br. Potomac, Raystown, U. Juniata, U. W. Br. Susquehanna, Sinnemahoning, Pine, Tioga, Chemung, Owego-Wappasening, U. Susquehanna, U. Delaware, U. Susquehanna-Tunkhannock, Lower W. Br. Susquehanna, U. Susquehanna-Lackawanna, Lackawaxen, Mid. Delaware-Mongaup-Brodhead, Lehigh, Mid. Delaware-Musconetcong, Crosswicks-Neshaminy, Schuylkill, Brandywine-Christina, Lower Susquehanna, Lower Susquehanna-Swatara, Lower Susquehanna-Penns

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Low

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Brook Floater conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Conococheague-Opequon, Lower Juniata, N. Br. Potomac, Raystown, U. Juniata, Bald Eagle, Lower Susquehanna-Penns, Lower Susquehanna-Swatara, Monocacy, Lower Susquehanna, Brandywine-Christina, Lower Delaware, Schuylkill, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead, U. Delaware, U. Susquehanna, Owego-Wappasening, Chemung, Pine, Mid. W. Br. Susquehanna, U. Susquehanna-Tunkhannock, U. Susquehanna-Lackawanna, Lower W. Br. Susquehanna, Chester-Sassafras, Tioga

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Brook Floater and other members of the Alasmidonta genus. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, Conservancies & Land Trusts, Delaware River Basin Commission, U.S. Geological Survey, Susquehanna River Basin Commission
2	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Delaware River Basin Commission, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct Delaware, Potomac, and Susquehanna River basin mussel surveys to determine extent of species distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations, U.S. Fish and Wildlife Service

Name: Brook Floater status monitoring **Lead(s) :** PFBC

Link: N/A

Description: Develop a long-term species monitoring program for the Delaware, Potomac, and Susquehanna River basins.

Monitoring Need: Monitor species strongholds to establish baseline species status for trend analysis.

Pennsylvania Fish and Boat Commission. 2022. Climate Action Plan: Strategies for enhancing climate adaptation and resilience to protect, conserve, and enhance Pennsylvania's aquatic resources and support anglers and boaters, version 2022-1.0. Harrisburg, Pennsylvania.

PENNSYLVANIA WILDLIFE ACTION PLAN

Threeridge

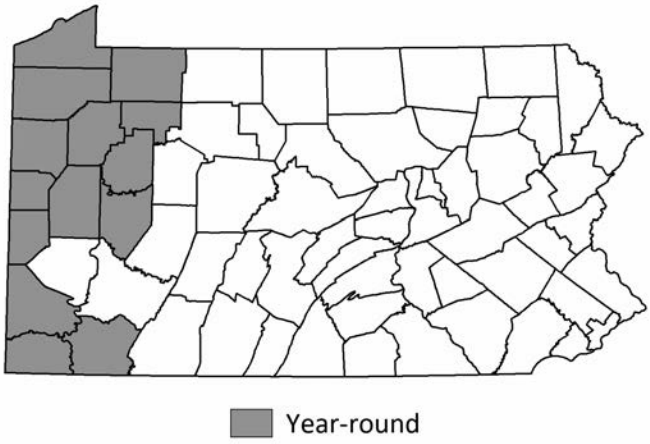
Amblema plicata

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



J. Allison, Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** High - Low

Specific Threat: Variable flows due to Pymatuning Dam operations.

Action Category: Manage non-living habitat components

Specific Action: Manage water flows to minimize and avoid risks to Shenango River mussel population.

Objective: Maintain Pymatuning Reservoir discharges at 40 cubic feet per second or greater.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Daily discharge from Pymatuning Reservoir not less than 40 cubic feet per second.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Shenango

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Chautauqua-Conneaut, French, Conewango, Shenango, Mid. Allegheny-Tionesta, Beaver, U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Connoquenessing

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Low

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Threeridge conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

Locations: HUC8 Watershed: French, Shenango, Mid. Allegheny-Tionesta, U. Allegheny, Connoquenessing, U. Ohio, Lower Allegheny

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

No known monitoring programs.

Pennsylvania Fish and Boat Commission. 2024. Instream flow study for the maintenance of freshwater mussel populations in the Shenango River, Crawford County, Pennsylvania. Division of Environmental Services, Bellefonte, PA.

PENNSYLVANIA WILDLIFE ACTION PLAN

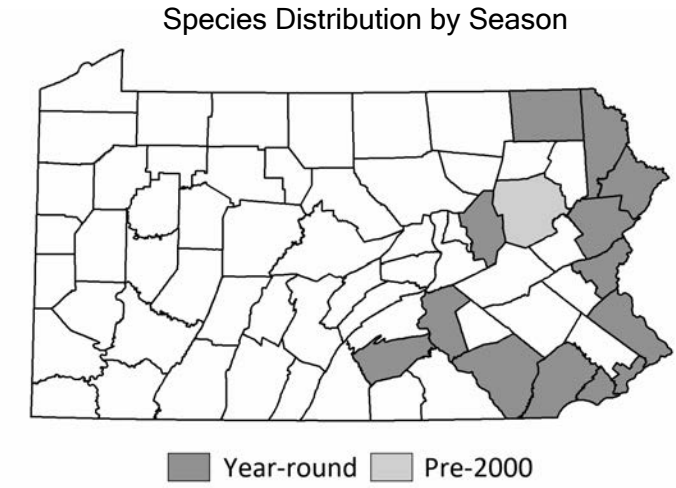
Alewife Floater

Utterbackiana implicata

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



G. Lech, Pennsylvania Fish and Boat Commission



Conservation Profile

PA 10-Year Conservation Goal: Increase the amount of available habitat for this species via restoration activities (e.g., dam removals, fish passage, etc.)

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Medium

Specific Threat: Reduction of wetted habitat or shifting of occupied habitat due to climate change-driven droughts and/or floods paired with increased erosion.

Action Category: Mitigate human environmental impact

Specific Action: Work with willing dam owners to provide fish passage or remove large dams to benefit freshwater mussel populations and their associated host fishes.

Objective: Increase host fish passage and host fish access to natural stream and river habitats to sustain or expand mussel populations.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of stream miles restored.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Universities & research institutions, U.S. Army Corps of Engineers

Locations: HUC8 Watershed: Lower Susquehanna, Lower Susquehanna-Swatara, Lower Susquehanna-Penns, Lower W. Br. Susquehanna, U. Susquehanna-Lackawanna, Bald Eagle, Pine, Mid. Delaware-Mongaup-Brodhead, Mid. Delaware-Musconetcong, Crosswicks-Neshaminy, Lower Delaware, Schuylkill, Brandywine-Christina

Other species likely to benefit from this action: All other native host fishes and associated mussel communities.

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Susquehanna River Basin Commission, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Lower Susquehanna, Lower Susquehanna-Swatara, Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead, U. Delaware, U. Susquehanna, Lehigh, Schuylkill, Brandywine-Christina

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Low

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Alewife Floater conflicts or known locations.

Potential Collaborators: Businesses, Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Lower Susquehanna, Lower Susquehanna-Swatara, Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead, U. Delaware, Schuylkill, Lehigh

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Alewife Floaters. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, Other state agency
2	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Delaware River Basin Commission, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, Universities & research institutions

No known monitoring programs.

Pennsylvania Fish and Boat Commission. 2022. Climate Action Plan: Strategies for enhancing climate adaptation and resilience to protect, conserve, and enhance Pennsylvania's aquatic resources and support anglers and boaters, version 2022-1.0. Harrisburg, Pennsylvania.

PENNSYLVANIA WILDLIFE ACTION PLAN

Flat Floater

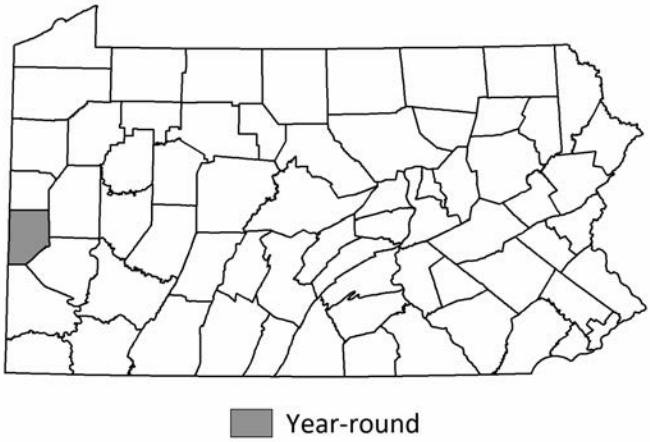
Utterbackiana suborbiculata

Nevin T. Welte — *Pennsylvania Fish and Boat Commission*



Naturalis Biodiversity Center, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank:

IUCN Red List Designation:

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status:

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Low

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of permits reviewed associated with Flat Floater conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Lower Monongahela

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Cylindrical Papershell

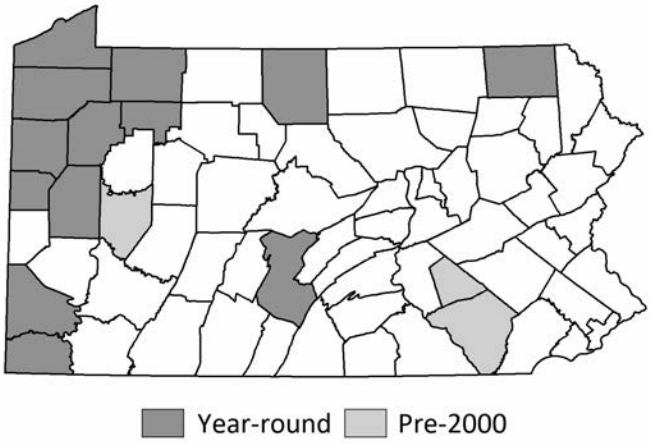
Anodontoides ferussacianus

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



Naturalis Biodiversity Center, via Wikimedia CommonsNaturalis_Biodiversity_Center_-_ZMA.MOLL.213784_-_Anodontoides_ferussacianus_(Lea,_1834)_-_Unionidae_-_Mollusc_shell

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: U. Genesee, U. Allegheny, Conewango, French, Chautauqua-Conneaut, Shenango, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** Medium - Low

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Dwarf Wedgemussel conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

Locations: HUC8 Watershed: Ashtabula-Chagrin, Chautauqua-Conneaut, French, Shenango, Connoquenessing, Mid. Allegheny-Tionesta, U. Allegheny, Conewango, U. Genesee, Mid. Allegheny-Redbank, Clarion

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct surveys of French Creek and Allegheny River basin headwater streams to ascertain and update current species distribution.	Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Universities & research institutions
2	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Fanshell

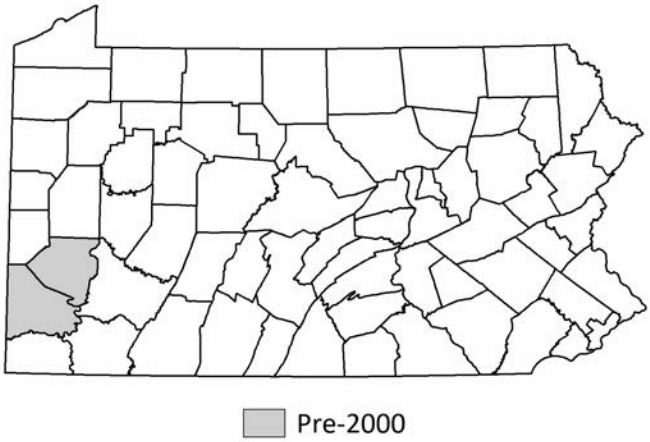
Cyprogenia stegaria

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



N. Welte, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Redetect and identify potential restoration habitat for this species.

NatureServe Global Rank: G1

IUCN Red List Designation: Critically Endangered

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Endangered

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Medium

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of permits reviewed associated with Fanshell conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Using translocated or propagated and cultured mussels, determine Ohio and Allegheny River restoration potential via silo studies or small, permanent monitoring plots.	Conservancies & Land Trusts, Other federal agency, Other state agency, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, Non-governmental organizations
2	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan.	Conservancies & Land Trusts, Non-governmental organizations, Other federal agency, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, U.S. Geological Survey
3	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts, U.S. Fish and Wildlife Service

Name: Fanshell restoration monitoring

Lead(s) : PFBC. USFWS

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

U.S. Fish and Wildlife Service. 1991. Fanshell (Cyprogenia stegaria) Recovery Plan. Atlanta, Georgia.

PENNSYLVANIA WILDLIFE ACTION PLAN

Butterfly

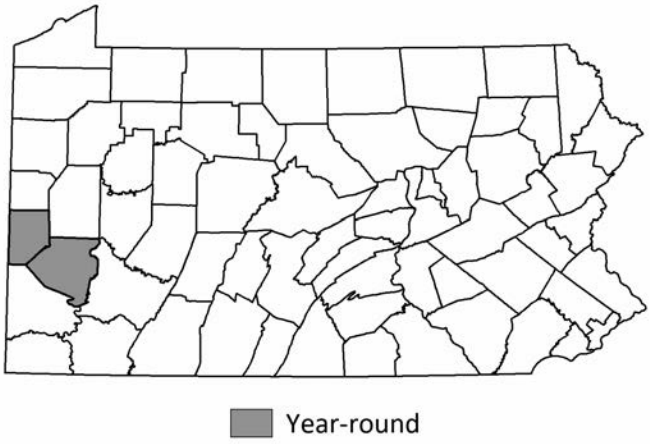
Ellipsaria lineolata

Nevin T. Welte — *Pennsylvania Fish and Boat Commission*



T. Menard, USFWS Mountain Prairie, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine species status and recovery potential.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Near Threatened

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Medium

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Butterfly conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** Medium

Specific Threat: Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed wastewater discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Butterfly conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** Medium

Specific Threat: Risk of an industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Butterfly conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Using translocated or propagated and cultured mussels, determine Ohio and Allegheny River restoration potential via silo studies or small, permanent monitoring plots.	Conservancies & Land Trusts, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Other state agency, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Geological Survey, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Determine extent of the Butterfly's distribution in the Ohio and Allegheny rivers and identify potential restoration areas.	Conservancies & Land Trusts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Non-governmental organizations
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection

Name: Butterfly status monitoring **Lead(s) :** PFBC

Link: N/A

Description: Once species' Pennsylvania strongholds are identified, initiate monitoring program to determine effects of future restoration and recovery actions.

Monitoring Need: Monitor species strongholds to establish baseline species status for trend analysis.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Elephantear

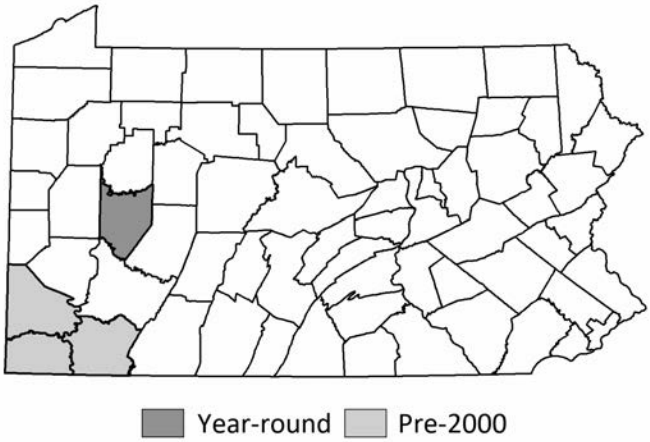
Elliptio crassidens

Nevin T. Welte — *Pennsylvania Fish and Boat Commission*



Muséum national d'histoire naturelle, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations. Redetect and identify potential restoration habitat for this species.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2025

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Habitat Comments: This species was rediscovered, alive, in the Allegheny River July 2025 by PFBC staff.

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Very High

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Elephantear conflicts or known locations.

Potential Collaborators:

Locations: HUC8 Watershed: Mid. Allegheny-Redbank, Lower Allegheny. HUC10 Watershed: Allegheny R. (Mid. Allegheny-Redbank), Allegheny R. (Lower Allegheny)

Other species likely to benefit from this action: Other freshwater mussels, native fishes.

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Conservancies & Land Trusts
4	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Northern Riffleshell

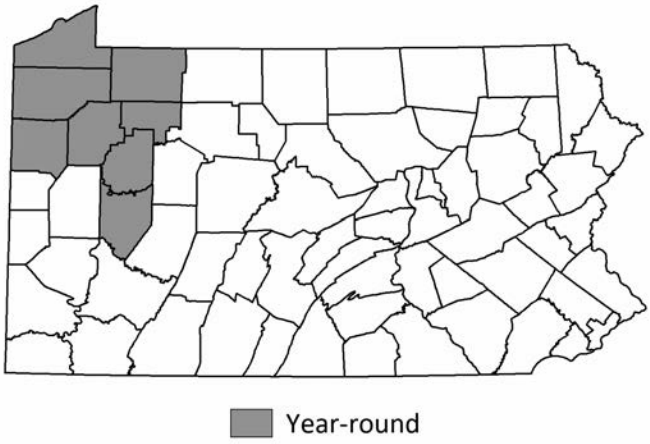
Epioblasma rangiana

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



N. Welte, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Northern Riffleshell in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G1

IUCN Red List Designation: Critically Endangered

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Endangered

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season):

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance:

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat:

Primary Habitat Type:

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High

Specific Threat: Risk of an oil or gas spill and impacts of brine discharge (chlorides). Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Northern Riffleshell conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Allegheny, Conewango, French, Mid. Allegheny-Tionesta, Clarion, Shenango, Mid. Allegheny-Redbank

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: French, Shenango, Mid. Allegheny-Tionesta, U. Allegheny, Conewango, Lower Allegheny, Mid. Allegheny-Redbank

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Northern Riffleshell and Snuffbox. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection
2	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan. Assist PFBC with Pennsylvania-specific species recovery goals outlined in Species Action Plans.	Conservancies & Land Trusts, Non-governmental organizations, Other federal agency, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, U.S. Geological Survey
3	Complete age and growth analysis for stable Pennsylvania populations to assess populations trends and interannual variability in reproductive success.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
4	Where appropriate, use translocated adults or propagated and cultured mussels to determine restoration potential via silo studies or small, permanent monitoring plots.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
5	Complete a genetic analysis of individuals translocated from the upper Allegheny River to provide parentage/lineage information useful in assessing the success of past recovery initiatives through the species range.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Universities & research institutions, Conservancies & Land Trusts, Non-governmental organizations

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, U.S. Geological Survey
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, U.S. Geological Survey, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

Name: Hunter Station Mussel Northern Riffleshell relocation monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop and implement a long-term monitoring plan and database to assess Shenango River and Conewango Creek mussel recovery efforts resulting from translocation of adults from Allegheny River source populations

Monitoring Need: Evaluate effectiveness of Shenango River and Conewango Creek augmentation initiatives.

Name: Northern Riffleshell recovery monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Name: Northern Riffleshell status monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

PFBC. 2025. Species Action Plan: Northern Riffleshell (Epioblasma rangiana)

U.S. Fish and Wildlife Service. 1994. Clubshell (Pleurobema clava) and Northern RIffleshell (Epioblasma torulosa rangiana) Recovery Plan. Hadley, Massachusetts.

PENNSYLVANIA WILDLIFE ACTION PLAN

Snuffbox

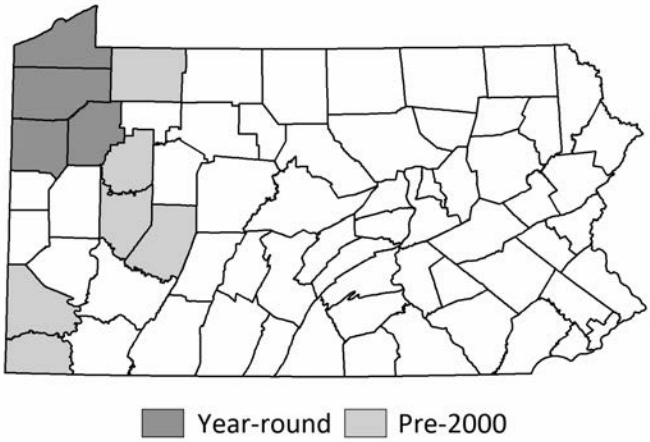
Epioblasma triquetra

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



N. Welte, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Snuffbox in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G2G3

IUCN Red List Designation: Endangered

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Endangered

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Medium rivers.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Shenango, French, Mid. Allegheny-Tionesta, U. Allegheny, Mid. Allegheny-Redbank

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Very High - Medium

Specific Threat: Variable flows due to Pymatuning Dam operations.

Action Category: Manage non-living habitat components

Specific Action: Manage water flows to minimize and avoid risks to Shenango River mussel population.

Objective: Maintain Pymatuning Reservoir discharges at 40 cubic feet per second or greater.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Daily discharge from Pymatuning Reservoir not less than 40 cubic feet per second.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Shenango

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Low

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Snuffbox conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: French, Shenango, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Monongahela

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High

Specific Threat: Introduction of the molluscivorous Round Goby into LeBoeuf and French creeks. Nonnative plants (e.g., Hydrilla) may have potentially have an adverse affect on the Shenango River population's habitat.

Action Category: Outreach, communication and distribution

Specific Action: Conduct angler outreach regarding Round Goby (Neogobius melanostomus) adverse effects on native freshwater mussels.

Objective: Provide signage and social media content.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of individuals reached via social media, number of signs placed.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: HUC8 Watershed: French, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Monitor and evaluate effects of Round Goby on freshwater mussels. Monitor and evaluate effects of any Round Goby control efforts.	Conservancies & Land Trusts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Non-governmental organizations, Universities & research institutions, U.S. Fish and Wildlife Service
2	Develop propagation and culture technologies for producing Snuffbox and Northern Riffleshell (both members of the Epioblasma genus). Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission
3	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan. Assist PFBC with Pennsylvania-specific species recovery goals outlined in Species Action Plans.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission
4	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Universities & research institutions, U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, U.S. Geological Survey
5	Determine a federal water quality standard for chloride that is protective of this species.	Pennsylvania Department of Environmental Protection, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

Name: Snuffbox restoration monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Name: Snuffbox status monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

Monitoring Need: French Creek, Shenango River, and Little Shenango River are in particular need of long-term Snuffbox monitoring sites.

Clark, K.H., Iwanowicz, D.D., Iwanowicz, L.R., Mueller, S.J., Wisor, J.M., Bradshaw-Wilson, C., Shill, W.B., Stauffer, Jr., J.R., and E.W. Boyer. 2022. Freshwater unionid mussels threatened by predation of Round Goby (Neogobius melanostomus). Scientific Reports. 12:12859. https://doi.org/10.1038/s41598-022-16385-y

Pennsylvania Fish and Boat Commission. 2024. Instream flow study for the maintenance of freshwater mussel populations in the Shenango River, Crawford County, Pennsylvania. Division of Environmental Services, Bellefonte, PA.

PFBC. 2025. Species Action Plan: Snuffbox (Epioblasma triquetra)

U.S. Fish and Wildlife Service. 2024. Recovery Plan for Four Species of Freshwater Mussels: Rayed Bean (Villosa fabalis), Sheepnose (Plethobasus cyphyus), Snuffbox (Epioblasma triquetra), and Spectaclecase (Cumberlandia monodonta). Bloomington, Minnesota.

PENNSYLVANIA
WILDLIFE ACTION PLAN

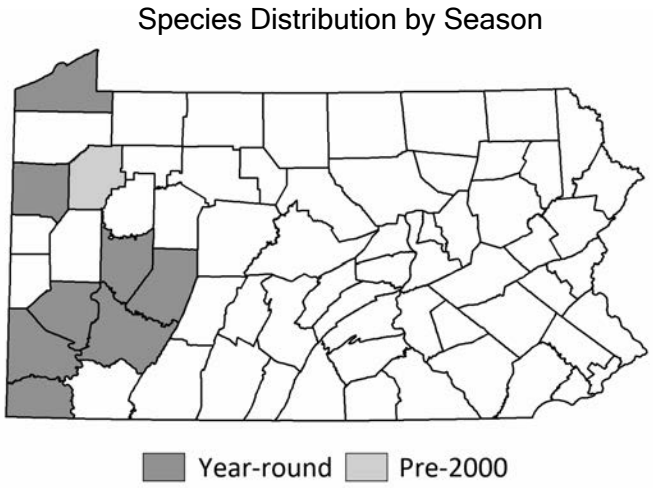
Wabash Pigtoe

Fusconaia flava

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



Pennsylvania Fish and Boat Commission



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Lower Allegheny, Mid. Allegheny-Redbank, U. Ohio, Mid. Allegheny-Tionesta, French, Chautauqua-Conneaut

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** Medium - Low

Specific Threat: Risk of an oil or gas spill and impacts of brine discharge (chlorides). Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Dwarf Wedgemussel conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Chautauqua-Conneaut, French, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny, U. Ohio, Lower Monongahela

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Longsolid

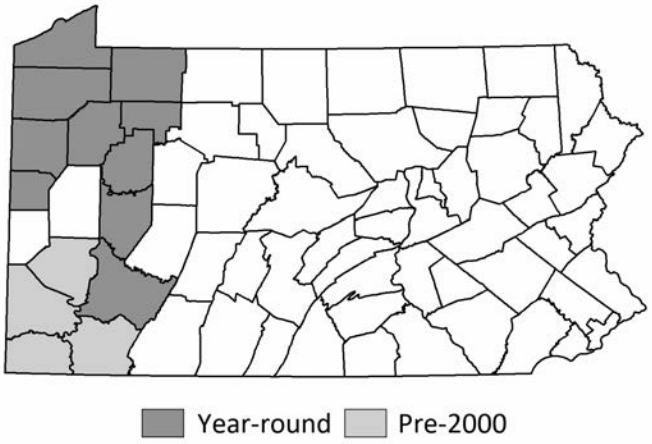
Fusconaia subrotunda

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



D. Biggins, U.S. Fish and Wildlife Service, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G3

IUCN Red List Designation: Vulnerable

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Threatened

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Threatened

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: French, Shenango, Beaver, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High

Specific Threat: Risk of an oil or gas spill and impacts of brine discharge (chlorides). Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Longsoild conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Shenango, French, U. Allegheny, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Introduction of the molluscivorous Round Goby into LeBoeuf and French creeks.

Action Category: Outreach, communication and distribution

Specific Action: Conduct angler outreach regarding Round Goby (Neogobius melanostomus) adverse effects on native freshwater mussels.

Objective:

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of individuals reached via social media, number of signs placed.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, Universities & research institutions

Locations: HUC8 Watershed: French, Mid. Allegheny-Tionesta

Other species likely to benefit from this action: Provide signage and social media content.

Season: Year-round

Priority	Need	Partners
1	Monitor and evaluate effects of Round Goby on freshwater mussels. Monitor and evaluate effects of any Round Goby control efforts.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Develop propagation and culture technologies for producing Longsolid and other members of the Fusconaia genus. Since no host fish are known, conduct host fish trials to ascertain a suite of potentially suitable wild host fishes and production host fishes.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission
3	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan. Assist PFBC with Pennsylvania-specific species recovery goals outlined in Species Action Plans.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
4	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

Name: Longsolid restoration monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Name: Longsolid status monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

Clark, K.H., Iwanowicz, D.D., Iwanowicz, L.R., Mueller, S.J., Wisor, J.M., Bradshaw-Wilson, C., Shill, W.B., Stauffer, Jr., J.R., and E.W. Boyer. 2022. Freshwater unionid mussels threatened by predation of Round Goby (Neogobius melanostomus). Scientific Reports. 12:12859. https://doi.org/10.1038/s41598-022-16385-y

PFBC. 2025. Species Action Plan: Longsolid (Fusconaia subrotunda).

PENNSYLVANIA
WILDLIFE ACTION PLAN

Yellow Lampmussel

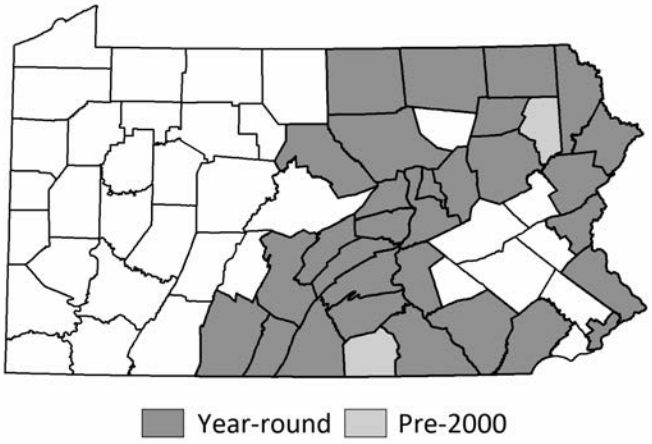
Lampsilis cariosa

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Increase the amount of available habitat for this species via restoration activities (e.g., dam removals, fish passage, mine drainage remediation, etc.)

NatureServe Global Rank: G3G4

IUCN Red List Designation: Vulnerable

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Low

Specific Threat: Risk of an oil or gas spill and impacts of brine discharge (chlorides). Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Yellow Lampmussel conflicts or known locations.

Potential Collaborators: Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Susquehanna River Basin Commission, U.S. Environmental Protection Agency

Locations: HUC8 Watershed: N. Br. Potomac, Cacapon-Town, Conococheague-Opequon, Monocacy, Lower Susquehanna, Chester-Sassafras, Brandywine-Christina, Lower Delaware, Schuylkill, Lehigh, Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead, Lackawaxen, U. Delaware, U. Susquehanna, Owego-Wappasening, Chemung, U. Susquehanna-Tunkhannock, U. Susquehanna-Lackawanna, Lower Susquehanna-Swatara, Lower Juniata, Raystown, U. Juniata, Bald Eagle, Lower Susquehanna-Penns, Lower W. Br. Susquehanna, Mid. W. Br. Susquehanna, Pine, Tioga, U. W. Br. Susquehanna, Sinnemahoning

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Determine species restoration potential and restoration needs in the Susquehanna and Delaware River basins. Using translocated or propagated and cultured mussels, determine restoration potential via silo studies or small, permanent monitoring plots.	Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, Universities & research institutions, Conservancies & Land Trusts, Delaware River Basin Commission, Non-governmental organizations
2	Develop propagation and culture technologies for producing Yellow Lampmussel and other members of the Lampsilis genus. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission
3	Examine the effect of abandoned mine drainage on water quality and mussel shell formation with implications for mussel recovery in impaired watersheds.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, Susquehanna River Basin Commission
4	Determine climate change effects on Yellow Lampmussel populations.	Non-governmental organizations, Universities & research institutions, Conservancies & Land Trusts
5	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Delaware River Basin Commission, Susquehanna River Basin Commission, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct mussel surveys in the lower Susquehanna River pools and Delaware River and estuary and identify potential restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, U.S. Fish and Wildlife Service
2	Conduct additional surveys, as necessary, to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Conservancies & Land Trusts, Non-governmental organizations, U.S. Fish and Wildlife Service
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, Universities & research institutions, U.S. Fish and Wildlife Service
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service

Name: Yellow Lampmussel status monitoring **Lead(s) :** PFBC

Link: N/A

Description: Monitor species strongholds to establish baseline species status for trend analysis.

Pennsylvania Fish and Boat Commission. 2022. Climate Action Plan: Strategies for enhancing climate adaptation and resilience to protect, conserve, and enhance Pennsylvania's aquatic resources and support anglers and boaters, version 2022-1.0. Harrisburg, Pennsylvania.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pink Mucket

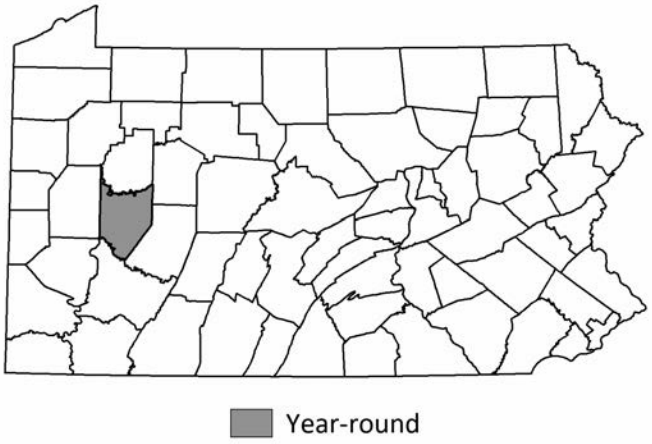
Lampsilis abrupta

Nevin T. Welte — *Pennsylvania Fish and Boat Commission*



C. Stihler, U.S. Fish and Wildlife Service, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Redetect and identify potential restoration habitat for this species.

NatureServe Global Rank: G1G2

IUCN Red List Designation: Vulnerable

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Endangered

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Medium

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Pink Mucket conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta, U. Ohio

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** High - Low

Specific Threat: Wastewater treatment plants and associated effluents, risk of industrial accidents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed wastewater discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Pink Mucket conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High

Specific Threat: Invasive mussels (Zebra Mussels) may impact this species.

Action Category: Outreach, communication and distribution

Specific Action: Communicate importance of cleaning boats, bilges, and fishing gear to prevent Zebra Mussel spread.

Objective: Provide boaters and recreational anglers information regarding cleaning boats, gear.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of people reached.

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Using translocated or propagated and cultured mussels, determine Ohio and Allegheny River restoration potential via silo studies or small, permanent monitoring plots.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Universities & research institutions, Conservancies & Land Trusts, Non-governmental organizations
2	Develop propagation and culture technologies for producing Pink Mucket and other members of the Lampsilis genus. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	U.S. Fish and Wildlife Service, Universities & research institutions, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection
3	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
4	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Other state agency, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, U.S. Fish and Wildlife Service
2	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, Universities & research institutions
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

No known monitoring programs.

U.S. Fish and Wildlife Service. 1985. Recovery Plan for the Pink Mucket Pearly Mussel Lampsilis orbiculata (Hildreth, 1828) Atlanta, Georgia.

PENNSYLVANIA
WILDLIFE ACTION PLAN

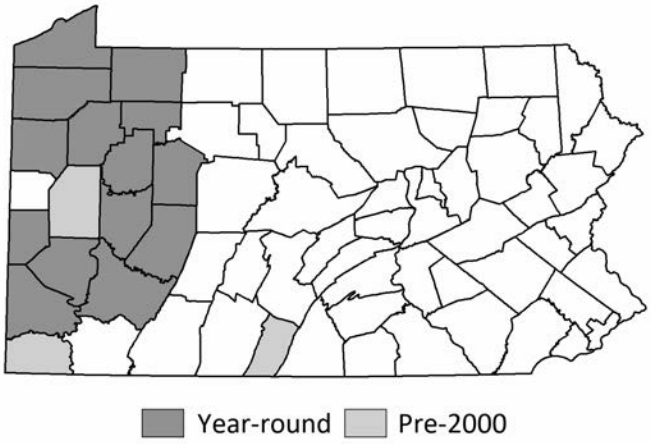
Pocketbook

Lampsilis ovata



D. Biggins, U.S. Fish and Wildlife Service, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Complementary or alternative conservation measures

Specific Action: Consult with developers to protect this species' habitats and incorporate best management practices (BMPs) into development plans.

Objective: Avoid or minimize harm.

Action Priority: 4-Low **Action Urgency:** Initiate within 5-10 years **Measure:** Avoid or minimize harm.

Potential Collaborators: Businesses, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners, U.S. Army Corps of Engineers

Locations:

Other species likely to benefit from this action:

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

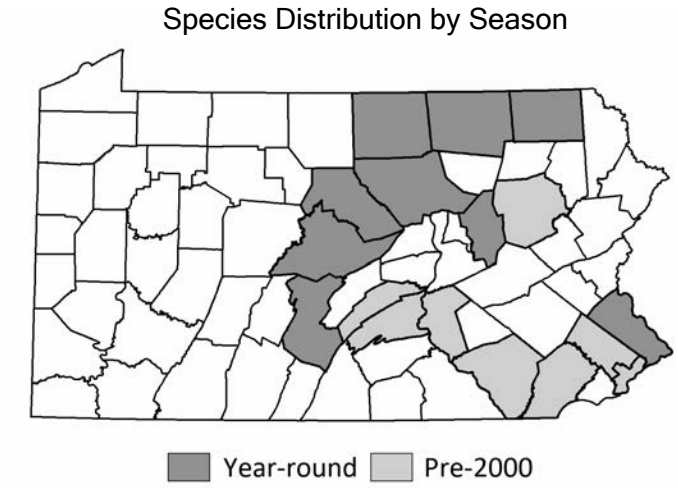
Eastern Lampmussel

Lampsilis radiata

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



M. Walsh, Western Pennsylvania Conservancy



Conservation Profile

PA 10-Year Conservation Goal: Restore this species populations in the Susquehanna and Delaware River drainages.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Low

Specific Threat: Sedimentation and eutrophication of the Susquehanna River basin and their effects on hosts.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: U. Susquehanna, Lower W. Br. Susquehanna, Mid. W. Br. Susquehanna, U. W. Br. Susquehanna, Bald Eagle, Mid. Delaware-Musconetcong, Crosswicks-Neshaminy, Lower Delaware, Brandywine-Christina, Mid. Delaware-Mongaup-Brodhead

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** High - Low

Specific Threat: Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed wastewater discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Eastern Lampmussel conflicts or known locations.

Potential Collaborators: Businesses, Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

Locations: HUC8 Watershed: Tioga, Chemung, Owego-Wappasening, U. Susquehanna-Tunkhannock, Pine, Mid. W. Br. Susquehanna, U. W. Br. Susquehanna, Lower W. Br. Susquehanna, Bald Eagle, Lower Susquehanna-Penns, Lower Susquehanna-Swatara, Lower Susquehanna

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Low

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Eastern Lampmussel conflicts or known locations.

Potential Collaborators: Businesses, Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

Locations: HUC8 Watershed: Lower Susquehanna-Swatara, Lower Susquehanna-Penns, Bald Eagle, U. W. Br. Susquehanna, Mid. W. Br. Susquehanna, Pine, Lower W. Br. Susquehanna, Tioga, U. Susquehanna, U. Susquehanna-Tunkhannock, Mid. Delaware-Musconetcong, Crosswicks-Neshaminy, Lower Delaware

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Work with PFBC and MDNR to develop propagation and culture technologies for producing EasternLampmussel and other members of the Lampsilis genus. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, Other state agency
2	Using translocated or propagated and cultured mussels, determine restoration potential via silo studies or small, permanent monitoring plots.	Other state agency, Non-governmental organizations, Pennsylvania Fish and Boat Commission
3	Work with state partners (e.g., MDNR) and academics to determine the extent, if any, of secondary contact with other members of the Lampsilis genus.	Other state agency, Universities & research institutions
4	Examine the effect of abandoned mine drainage on water quality and mussel shell formation with implications for mussel recovery in impaired watersheds.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, Universities & research institutions
5	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Susquehanna River Basin Commission, Delaware River Basin Commission, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Susquehanna and Delaware River basin mussel surveys to determine extent of species distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Delaware River Basin Commission, Susquehanna River Basin Commission, Universities & research institutions, U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Name: Eastern Lampmussel status monitoring **Lead(s) :** PFBC

Link: N/A

Description: Monitor species strongholds to establish baseline species status for trend analysis.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

White Heelsplitter

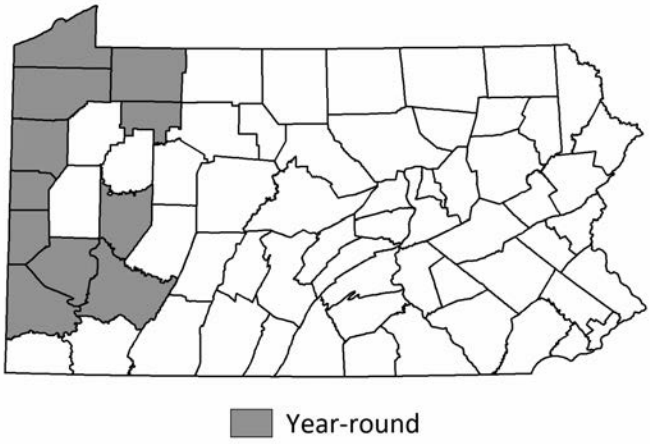
Pterosyna complanata

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



Naturalis Biodiversity Center, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Medium

Specific Threat: Commercial sand and gravel dredging in the Ohio River.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of permits reviewed associated with Fanshell conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations:

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Medium - Low

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Manage non-living habitat components

Specific Action: Work with willing dam owners to provide fish passage or remove large dams to benefit freshwater mussel populations and their associated host fishes.

Objective: Increase host fish passage and host fish access to natural stream and river habitats to sustain or expand mussel populations.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of stream miles restored.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Use genetics to ascertain origins of French Creek and Ohio River White Heelsplitter population.	U.S. Fish and Wildlife Service, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

Name: White Heelsplitter status monitoring **Lead(s) :** PFBC

Link: N/A

Description: Monitor species strongholds to establish baseline species status for trend analysis.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Creek Heelsplitter

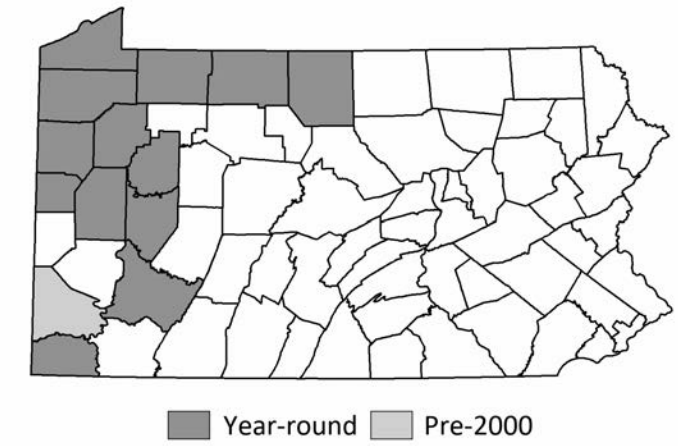
Platynaias compressa

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: U. Genesee, Tioga, U. Allegheny, Conewango, Chautauqua-Conneaut, French, Mid. Allegheny-Tionesta, Clarion, Shenango, Mid. Allegheny-Redbank

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Research effects of climate change on potential Creek Heelsplitter status and distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Develop propagation and culture technologies for producing Creek Heelsplitter to inform propagation and culture of the closely related Green Floater (Lasmigona subviridis). Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	
3	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct surveys to determine headwater distribution of Creek Heelsplitter in French Creek and upper Allegheny River basin (e.g., Potato, Oswayo, Honeoye creeks).	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission
2	Conduct surveys to determine headwater distribution of Creek Heelsplitter in eastern Allegheny River tributaries (e.g., Redbank Creek, upper Kiski and Conemaugh basins).	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission

No known monitoring programs.

Pennsylvania Fish and Boat Commission. 2022. Climate Action Plan: Strategies for enhancing climate adaptation and resilience to protect, conserve, and enhance Pennsylvania's aquatic resources and support anglers and boaters, version 2022-1.0. Harrisburg, Pennsylvania.

PENNSYLVANIA WILDLIFE ACTION PLAN

Green Floater

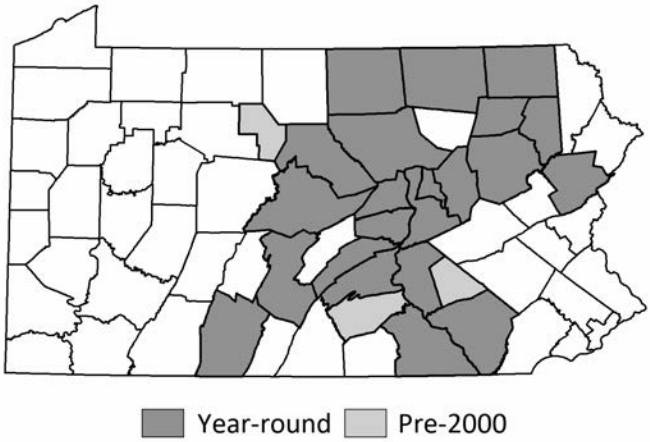
Platynaias subviridis

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G2G3

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Proposed Threatened

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Warm, Small River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, Universities & research institutions, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Lower W. Br. Susquehanna, Bald Eagle, U. W. Br. Susquehanna, Lower Susquehanna-Penns, U. Juniata, Lehigh, Raystown, Lower Juniata, Lower Susquehanna-Swatara, Lower Susquehanna, Pine

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Green Floater. Preliminary surrogate work could commence with Creek Heelsplitter (Lasmigona compressa). Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Using translocated or propagated and cultured mussels, determine restoration potential via silo studies or small, permanent monitoring plots.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission
3	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
4	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Delaware River Basin Commission, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Pennsylvania Delaware River tributary mussel surveys are warranted to determine species presence. As both an example and motivator, PFBC survey efforts in the Lehigh River documented substantial numbers of Green Floaters in 2024.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, Delaware River Basin Commission, U.S. Fish and Wildlife Service, U.S. Geological Survey, Universities & research institutions, Other federal agency
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, Universities & research institutions, U.S. Fish and Wildlife Service
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Other federal agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Susquehanna River Basin Commission, Delaware River Basin Commission, U.S. Geological Survey, U.S. Fish and Wildlife Service

Name: Green Floater status monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Monitor species strongholds to establish baseline species status for trend analysis.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Fragile Papershell

Potamilus fragilis

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



J. Allison, Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Low

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Fragile Papershell conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** Medium - Low

Specific Threat: Pollution

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of permits reviewed associated with Fragile Papershell conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta, Lower Monongahela

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Fragile Papershell and other members of the Potamilus genus, primarily for Dunkard Creek mussel restoration. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Department of Environmental Protection, Non-governmental organizations
2	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

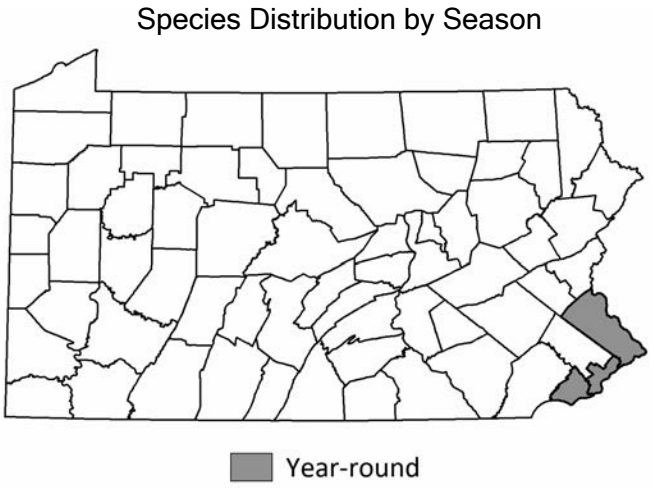
Tidewater Mucket

Atlanticoncha ochracea

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



G. Lech, Pennsylvania Fish and Boat Commission



Conservation Profile

PA 10-Year Conservation Goal: Increase the amount of available habitat for this species via restoration activities (e.g., dam removals, fish passage, etc.)

NatureServe Global Rank: G3G4

IUCN Red List Designation: Near Threatened

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** High

Specific Threat: Dams or lack of fish passage around dams may prevent natural Tidewater Mucket dispersal via its host fishes.

Action Category: Mitigate human environmental impact

Specific Action: Work with willing dam owners to provide fish passage or remove large dams to benefit freshwater mussel populations and their associated host fishes.

Objective: Increase host fish passage and host fish access to natural stream and river habitats to sustain or expand mussel populations.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of stream miles restored.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Army Corps of Engineers

Locations: HUC8 Watershed: Lower Susquehanna, Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Brandywine-Christina, Mid. Delaware-Mongaup-Brodhead

Other species likely to benefit from this action: All other native host fishes and associated mussel communities.

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Potential predation from recently discovered molluscivorous Freshwater Drum (Aplodinotus grunniens) in the Delaware Estuary.

Action Category: Outreach, communication and distribution

Specific Action: Conduct angler outreach regarding negative impacts of Freshwater Drum (Aplodinotus grunniens) release into the Delaware River.

Objective: Provide signage and social media content.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of individuals reached via social media, number of signs placed.

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Biological Survey, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC8 Watershed: Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Garbage and Solid Waste **Threat Impact:** Medium - Low

Specific Threat: Potential runoff or leaks from landfills.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of any proposed effluent discharges on lower Delaware River freshwater mussels, their hosts and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Tidewater Mucket conflicts or known locations.

Potential Collaborators: Businesses, Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

Locations: HUC8 Watershed: Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High

Specific Threat: Potential impact of saltwater intrusion associated with sea level rise combined with other climate change threats (e.g., low dissolved oxygen)

Action Category: Outreach, communication and distribution

Specific Action: Discuss the potential climate change effects on Tidewater Mussel and sportfish hosts to generate public awareness.

Objective: Increase public interactions with the Delaware River, its species, and identify ways individuals can contribute to mussel conservation in a changing climate.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Number of people reached.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

Locations: HUC8 Watershed: Lower Delaware, Lower Susquehanna, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead, Schuylkill, Brandywine-Christina

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Conduct Freshwater Drum stomach content analyses, using eDNA/DNA methodology if necessary, to ascertain actual Freshwater Drum predation upon native mussels, if any (e.g., Clark et al. 2022).	Delaware River Basin Commission, Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Develop propagation and culture technologies for producing Tidewater Mucket. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes. Work with Maryland and New Jersey to develop these technologies for any future collaborative Susquehanna or Delaware River basin restoration work.	Pennsylvania Fish and Boat Commission, Other state agency, Non-governmental organizations
3	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct Delaware River mussel surveys to ascertain and update current species distribution and identify potential species restoration areas.	Non-governmental organizations, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known, historical, or potential Susquehanna River Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Susquehanna River Basin Commission, Delaware River Basin Commission, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

Name: Tidewater Mucket status monitoring **Lead(s) :** PFBC

Link: N/A

Description: Monitor species strongholds to establish baseline species status for trend analysis.

Clark, K.H., Iwanowicz, D.D., Iwanowicz, L.R., Mueller, S.J., Wisor, J.M., Bradshaw-Wilson, C., Shill, W.B., Stauffer, Jr., J.R., and E.W. Boyer. 2022. Freshwater unionid mussels threatened by predation of Round Goby (Neogobius melanostomus). Scientific Reports. 12:12859. https://doi.org/10.1038/s41598-022-16385-y

Pennsylvania Fish and Boat Commission. 2022. Climate Action Plan: Strategies for enhancing climate adaptation and resilience to protect, conserve, and enhance Pennsylvania's aquatic resources and support anglers and boaters, version 2022-1.0. Harrisburg, Pennsylvania.

PENNSYLVANIA WILDLIFE ACTION PLAN

Eastern Pondmussel

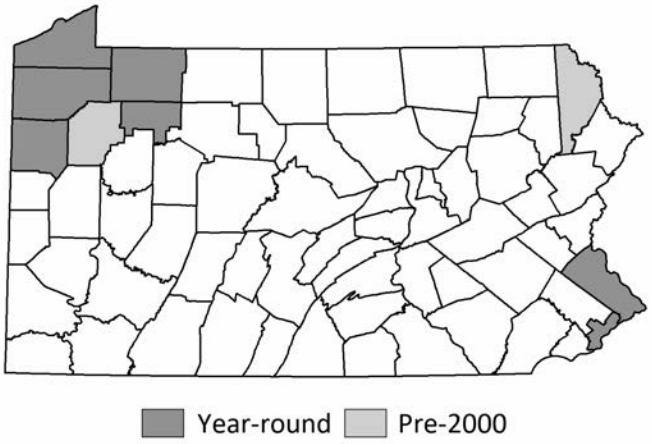
Sagittunio nasutus

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



K. Clark, Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain existing populations.

NatureServe Global Rank: G3

IUCN Red List Designation: Vulnerable

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Warm, Small River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Susquehanna River Basin Commission, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Conewango, U. Allegheny, Mid. Allegheny-Tionesta, Shenango, French, Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** High - Low

Specific Threat: Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed wastewater discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Eastern Pondmussel conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, U. Ohio, Shenango, Connoquenessing, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta, French, Chautauqua-Conneaut, U. Allegheny, Conewango

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Low

Specific Threat: Risk of an oil or gas spill and impacts of brine discharge (chlorides). Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Eastern Pondmussel conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Shenango, Chautauqua-Conneaut, French, U. Allegheny, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny, U. Ohio

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Delaware River Basin Commission, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Delaware River Basin Commission, Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission

No known monitoring programs.

Pennsylvania Fish and Boat Commission. 2022. Climate Action Plan: Strategies for enhancing climate adaptation and resilience to protect, conserve, and enhance Pennsylvania's aquatic resources and support anglers and boaters, version 2022-1.0. Harrisburg, Pennsylvania.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Eastern Pearlshell

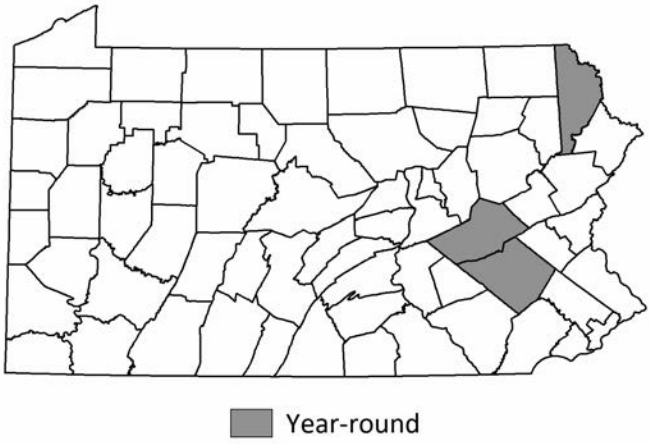
Margaritifera margaritifera

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



M. Walsh, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Eastern Pearlshell in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G4

IUCN Red List Designation: Endangered

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Moderate Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Headwaters and creeks with suitable trout habitat.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops

Threat Impact: Very High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Schuylkill, Lower Delaware, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead, U. Delaware

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Dams and Water Management/Use

Threat Impact: Very High

Specific Threat: Potential changes to flow management at Locust Lake or Tuscarora Lake.

Action Category: Protect resources with site infrastructure

Specific Action: Manage water flows to minimize and avoid risks to Schuylkill River basin Eastern Pearlshell population.

Objective: Maintain existing flow operations at Locust Lake and Tuscarora Lake reservoirs.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Water temperature and flows in Eastern Pearlshell streams.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Schuylkill

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Livestock Farming and Ranching

Threat Impact: Very High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams. Keep livestock out of streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of acres of forested or vegetative buffer. Number of miles of stream bank fencing.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service, U.S. Environmental Protection Agency

Locations: HUC8 Watershed: Schuylkill, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead, U. Delaware

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Medium

Specific Threat: Invasive diatom species (Didymo).

Action Category: Outreach, communication and distribution

Specific Action: Conduct angler outreach regarding Didymo (Didymosphenia geminata) adverse effects on native freshwater mussels.

Objective: Provide signage and social media content.

Action Priority: 3-Medium

Action Urgency: Initiate immediately

Measure: Number of individuals reached via social media, number of signs placed.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Delaware River Basin Commission, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: HUC8 Watershed: U. Delaware, Mid. Delaware-Mongaup-Brodhead, Schuylkill, Lower Delaware, Crosswicks-Neshaminy

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Determine Eastern Pearlshell Locust Creek flow needs and provide reservoir discharge management guidance.	Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Evaluate reintroduction and augmentation potential combining trout habitat and trout restoration with Eastern Pearlshell restoration in historically occupied streams or streams within the species historical range. Examine the effect of abandoned mine drainage on water quality and mussel shell formation with implications for mussel recovery in impaired watersheds.	Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Delaware River Basin Commission, Pennsylvania Association of Conservation Districts
3	Develop propagation and culture technologies for producing Eastern Pearlshell. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild/stocked host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, Pennsylvania Department of Conservation and Natural Resources
4	Using translocated or propagated and cultured mussels, determine restoration potential via silo studies or small, permanent monitoring plots. Evaluate efficacy of conducting in situ stream culture using inoculated host fishes.	Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission
5	Conduct eDNA surveys of Schuylkill River headwater tributaries, where appropriate, to determine presence of salmonids or Eastern Pearlshell.	Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Conduct opportunistic surveys in Schuylkill RIver basin headwater streams wherever possible.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources
2	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations
4	Conduct unassessed Schuylkill River basin trout surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Non-governmental organizations, Conservancies & Land Trusts, Delaware River Basin Commission, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Eastern Pearlshell restoration monitoring **Lead(s) :**

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Name: Eastern Pearlshell status monitoring **Lead(s) :**

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

Ortmann, A. E. 1919. A monograph of the naiads of Pennsylvania. Part III: Systematic account of the genera and species. Memoirs of the Carnegie Museum 8:xvi-384.

Pennsylvania Fish and Boat Commission. 2022. Climate Action Plan: Strategies for enhancing climate adaptation and resilience to protect, conserve, and enhance Pennsylvania's aquatic resources and support anglers and boaters, version 2022-1.0. Harrisburg, Pennsylvania.

PFBC. 2023. Species Action Plan: Eastern Pearlshell (Margaritifera margaritifera).

Western Pennsylvania Conservancy. 2015. Assessment of Eastern Pearl Shell distributions, populations, genetic diversity and habitat. A State and Tribal Wildlife Grants (# F13AF00473) project administered by the Pennsylvania Fish and Boat Commission. Harrisburg, Pennsylvania.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Threehorn Wartyback

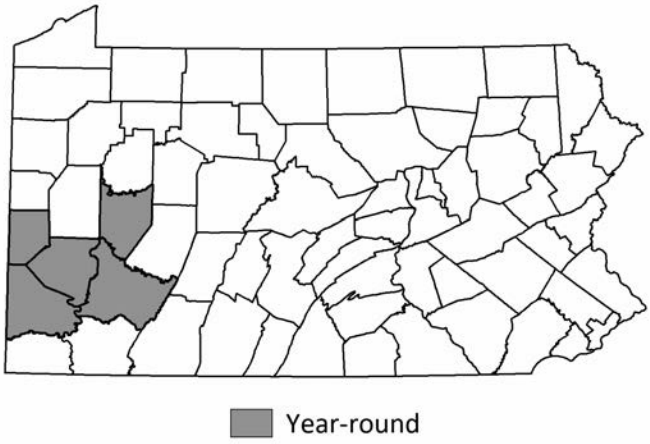
Obliquaria reflexa

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Very High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive mussels (Zebra Mussels) may impact this species.

Action Category: Outreach, communication and distribution

Specific Action: Communicate importance of cleaning boats, bilges, and fishing gear to prevent Zebra Mussel spread.

Objective: Provide boaters and recreational anglers information regarding cleaning boats, gear.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Number of people reached.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions

Locations: HUC8 Watershed: Chautauqua-Conneaut, U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Lower Monongahela

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey
2	Research Zebra Mussel densities at potential upper Ohio and Allegheny River mussel restoration sites.	Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission
2	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Round Hickorynut

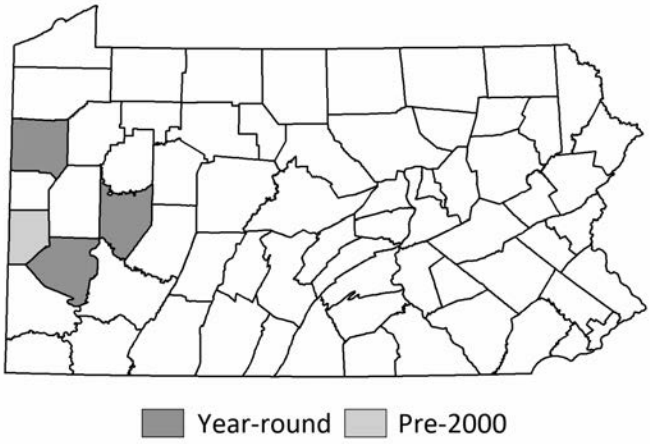
Obovaria subrotunda

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



N. Welte, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Round HIckorynut in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G3

IUCN Red List Designation: Endangered

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Threatened

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Warm, Small River

Season: Year-round

Threat Category: Dams and Water Management/Use

Threat Impact: High

Specific Threat: Variable flows due to Pymatuning Dam operations.

Action Category: Manage non-living habitat components

Specific Action: Manage water flows to minimize and avoid risks to Shenango River mussel population.

Objective: Maintain Pymatuning Reservoir discharges at 40 cubic feet per second or greater.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Daily discharge from Pymatuning Reservoir not less than 40 cubic feet per second.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Shenango

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents

Threat Impact: High - Low

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of permits reviewed associated with Round Hickorynut conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Shenango, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Determine if there are any proximate causes for the decline of this species in the Shenango River upstream and downstream of Shenango River Lake. If causes are identified, then evaluate conservation actions to address specific threats.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission
2	Develop propagation and culture technologies for producing Round Hickorynut. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
3	Using propagated and cultured mussels, identify additional Allegheny River locations with restoration potential via silo studies or small, permanent monitoring plots.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission
4	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan. Assist PFBC with Pennsylvania-specific species recovery goals outlined in Species Action Plans.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Geological Survey
5	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Universities & research institutions, Pennsylvania Fish and Boat Commission, U.S. Geological Survey, Pennsylvania Department of Environmental Protection

Season: Year-round

Priority	Survey	Partners
1	Conduct Pymatuning Reservoir tributary and reservoir mussel surveys. Conduct Round Hickorynut surveys in the Little Shenango River and its tributaries.	Pennsylvania Department of Environmental Protection, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Non-governmental organizations, U.S. Fish and Wildlife Service
2	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

Name: Round Hickorynut restoration monitoring

Lead(s) : PFBC. USFWS

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Monitoring Need: Need to monitor Allegheny River augmenation.

Name: Round Hickorynut status monitoring

Lead(s) : PFBC. USFWS

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

PFBC. 2025. Species Action Plan: Round Hickorynut (Obovaria subrotunda)

PENNSYLVANIA WILDLIFE ACTION PLAN

Sheepnose

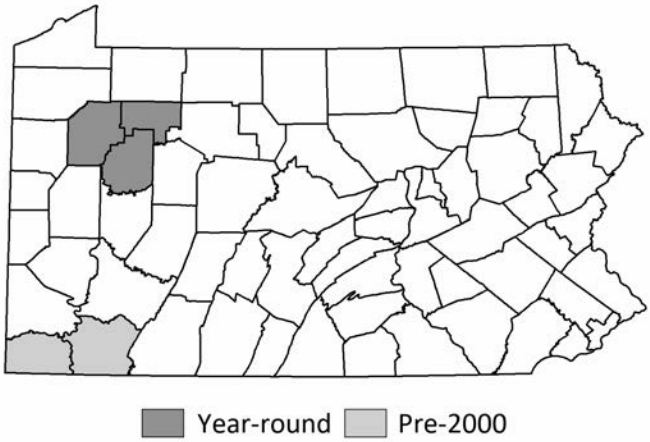
Plethobasus cyphyus

Nevin T. Welte — *Pennsylvania Fish and Boat Commission*



N. Welte, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Sheepnose in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G2G3

IUCN Red List Designation: Endangered

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Endangered

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Threatened

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Large rivers.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** High

Specific Threat: Variable flows due to Kinzua Dam operations.

Action Category: Manage non-living habitat components

Specific Action: Manage water flows to minimize and avoid risks to Allegheny River mussel population.

Objective: Operate Kinzua Dam using The Nature Conservancy's Sustainable Rivers Program guidance.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Maintaining a conservation flow regime.

Potential Collaborators: Pennsylvania Department of Environmental Protection, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Mid. Allegheny-Tionesta, U. Allegheny, Mid. Allegheny-Redbank, Lower Allegheny

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High

Specific Threat: Potential risk of pollution event.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Sheepnoseconflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations:

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Identify genetic conservation management unit information for Pennsylvania Sheepnose population. Use survey demographic information, a detailed threats assessment, and other information to determine whether additional restoration efforts (e.g., augmentations) are necessary to maintain and sustain Allegheny River Sheepnose population.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Universities & research institutions, U.S. Geological Survey
2	If warranted, develop propagation and culture technologies for producing Sheepnose. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
3	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan. Assist PFBC with Pennsylvania-specific species recovery goals outlined in Species Action Plans.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution. Determine whether there are any limiting factors restricting the Sheepnose's Allegheny River distribution.	Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations, U.S. Fish and Wildlife Service
2	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, Universities & research institutions
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

Name: Sheepnose restoration monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: 2. Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Name: Sheepnose status monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

PFBC. 2025. Species Action Plan: Sheepnose (Plethobasus cyphyus)

U.S. Fish and Wildlife Service. 2024. Recovery Plan for Four Species of Freshwater Mussels: Rayed Bean (Villosa fabalis), Sheepnose (Plethobasus cyphyus), Snuffbox (Epioblasma triquetra), and Spectaclecase (Cumberlandia monodonta). Bloomington, Minnesota.

PENNSYLVANIA WILDLIFE ACTION PLAN

Clubshell

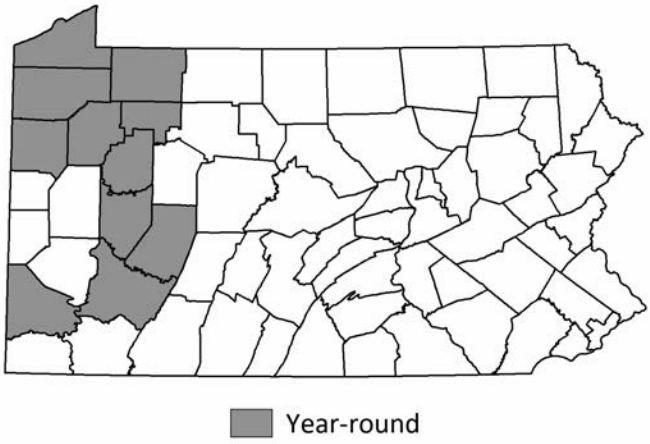
Pleurobema clava

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



N. Welte, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Clubshell in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G1G2

IUCN Red List Designation: Critically Endangered

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Endangered

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Medium rivers.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Habitat Comments: The Clubshell occupies a variety of Ohio River basin habitats ranging from smaller tributaries in the Loyalhanna River basin to the Allegheny River navigational pools.

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High

Specific Threat: Risk of an oil or gas spill and impacts of brine discharge (chlorides). Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Clubshell conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Allegheny, Conewango, French, Mid. Allegheny-Tionesta, Clarion, Mid. Allegheny-Redbank, Lower Allegheny, Kiskiminetas, Conemaugh, U. Ohio, Shenango

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Increase forested or vegetative cover along streams inhabited by this species.

Objective: Expand riparian corridors by 10% over 10 years.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Private Landowners, Township Zoning Boards

Locations: HUC8 Watershed: Shenango, French, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny, U. Allegheny, Conewango, Conemaugh

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Clubshell and other members of the Pleurobema genus. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Where appropriate, use translocated adults or propagated and cultured mussels to determine restoration potential via silo studies or small, permanent monitoring plots.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission
3	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan. Assist PFBC with Pennsylvania-specific species recovery goals outlined in Species Action Plans.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection
4	Complete age and growth analysis for stable Pennsylvania populations to assess populations trends and interannual variability in reproductive success.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
5	Complete a genetic analysis of individuals translocated from the upper Allegheny River to provide parentage/lineage information useful in assessing the success of past recovery initiatives through the species range.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Conduct survey of priority streams: 1) Sandy Creek, a tributary to the Allegheny River, and 2) Loyalhanna Creek basin.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, Universities & research institutions, Pennsylvania Department of Environmental Protection
4	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
5	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations

Name: Clubshell restoration monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: In addition to the Hunter Station monitoring program, develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future Clubshell translocation, augmentation, and reintroduction efforts.

Name: Clubshell status monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

Name: Hunter Station Clubshell relocation monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop and implement a long-term monitoring plan and database to assess Shenango River and Conewango Creek mussel recovery efforts resulting from translocation of adults from Allegheny River source populations

Monitoring Need: Evaluate effectiveness of Shenango River and Conewango Creek augmentation initiatives.

PFBC (2025) - Species Action Plan: Clubshell (Pleurobema clava)

U.S. Fish and Wildlife Service. 1994. Clubshell (Pleurobema clava) and Northern RIffleshell (Epioblasma torulosa rangiana) Recovery Plan. Hadley, Massachusetts.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Round Pigtoe

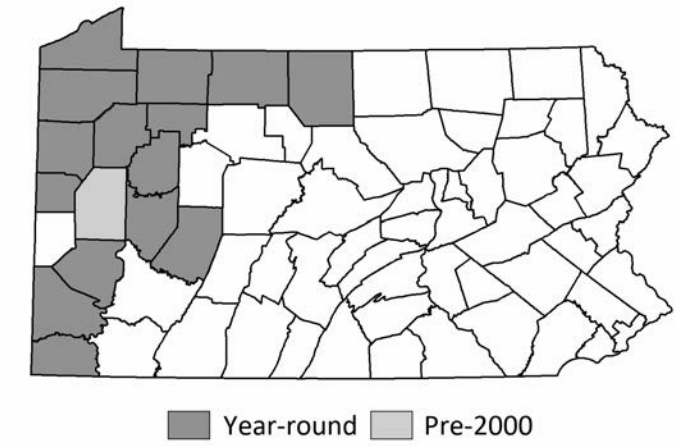
Pleurobema sintoxia

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G4?

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Chautauqua-Conneaut, French, U. Allegheny, Conewango, Clarion, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Connoquenessing, Kiskiminetas, Lower Allegheny, Youghiogheny, Lower Monongahela, U. Ohio-Wheeling, U. Ohio, Beaver, Shenango, Mahoning

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** High - Medium

Specific Threat: Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed wastewater discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Round Pigtoe conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Monongahela, Lower Allegheny, Connoquenessing, Shenango, Mid. Allegheny-Tionesta, French, Chautauqua-Conneaut, U. Allegheny, Conewango, Clarion, Mid. Allegheny-Redbank, Kiskiminetas, Conemaugh

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Medium

Specific Threat: Risk of an oil or gas spill and impacts of brine discharge (chlorides). Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Round Pigtoe conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Chautauqua-Conneaut, French, Shenango, Mid. Allegheny-Tionesta, U. Allegheny, Conewango, Clarion, Mid. Allegheny-Redbank, Connoquenessing, Lower Allegheny, U. Ohio, Kiskiminetas, Conemaugh, Lower Monongahela

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Round Pigtoe and other members of the Pleurobema genus, primarily to support Clubshell and Ohio Pigtoe restoration activities. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Other state agency, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
2	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service

Name: Round Pigtoe – Clarion River restoration monitoring **Lead(s) :**

Link: N/A

Description: Develop and implement long-term monitoring plan and database to assess Clarion River mussel recovery efforts using translocated adults from Allegheny River source populations.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ohio Pigtoe

Pleurobema cordatum

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



Naturalis Biodiversity Center, via Wikimedia Commons

Species Distribution by Season

Conservation Profile

PA 10-Year Conservation Goal: Redetect and identify potential restoration habitat for this species.

NatureServe Global Rank: G3G4

IUCN Red List Designation: Near Threatened

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Ohio Pigtoe conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations:

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Using translocated or propagated and cultured mussels, determine Ohio and Allegheny River restoration potential via silo studies or small, permanent monitoring plots.	Conservancies & Land Trusts, Non-governmental organizations, Other federal agency, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

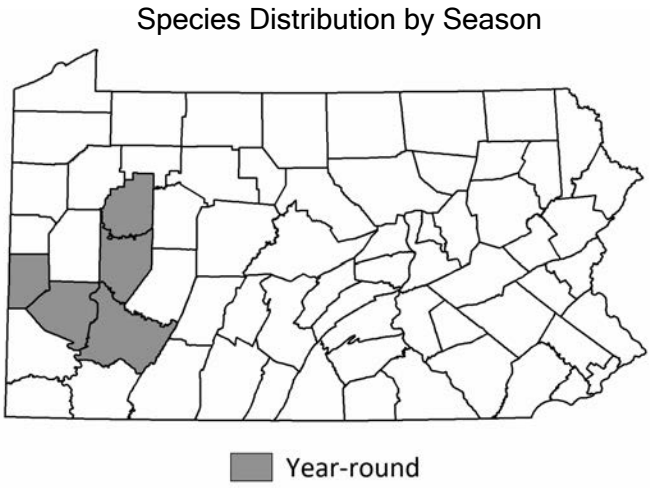
Pink Papershell

Potamilus ohiensis

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



D. Raab, Pennsylvania Fish and Boat Commission



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Low

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of permits reviewed associated with Pink Papershell conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Lower Allegheny, U. Ohio, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta, Lower Monongahela

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** High - Low

Specific Threat: Construction of proposed hydroelectric facilities on the Montgomery and Emsworth Lock & Dams.

Action Category: Manage non-living habitat components

Specific Action: Remove barriers to host fish passage. If barriers cannot be removed, improve or facilitate host fish passage around barriers. Attempt to restore natural flow regimes.

Objective:

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of barriers removed, stream miles restored.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Lower Monongahela, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rabbitsfoot

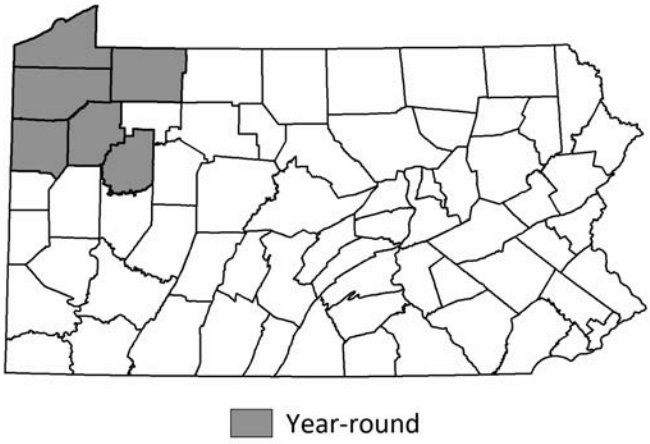
Theliderma cylindrica

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



N. Welte, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Rabbitsfoot in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G3

IUCN Red List Designation: Near Threatened

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Threatened

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Medium rivers.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: French, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny, Shenango

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Rabbitsfoot conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: French, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny, Shenango

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Rabbitsfoot and other members of the Theliderma genus. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan. Assist PFBC with Pennsylvania-specific species recovery goals outlined in Species Action Plans.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service
3	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey
4	Determine a federal water quality standard for chloride that is protective of this species.	Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency

Season: Year-round

Priority	Survey	Partners
1	Determine the extent of Rabbitsfoot distribution in priority areas: 1) the free-flowing section of the Allegheny River downstream of known Allegheny River occurrences, and 2) Shenango River basin.	Conservancies & Land Trusts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, Non-governmental organizations, U.S. Fish and Wildlife Service
2	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
3	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
4	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service
5	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service

Name: Rabbitsfoot restoration monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Name: Rabbitsfoot status monitoring **Lead(s) :** PFBC. USFWS

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

PFBC. 2025. Species Action Plan: Rabbitsfoot (Theliderma cylindrica)

U.S. Fish and Wildlife Service. 2023. Recovery Plan for the Rabbitsfoot (Quadrula cylindrica cylindrica, Say 1817). Atlanta, Georgia.

PENNSYLVANIA WILDLIFE ACTION PLAN

Mapleleaf

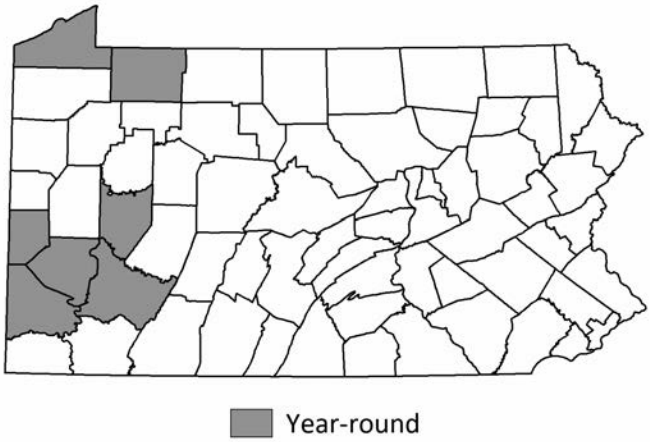
Quadrula quadrula

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



K. Clark, Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Medium

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Mapleleaf conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta, Lower Monongahela

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rockshell

Theliderma metanevra

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



D. Biggins, U.S. Fish and Wildlife Service, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest

Action Urgency: Initiate within 5-10 years

Measure: Number of permits reviewed associated with Monkeyface conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Using translocated or propagated and cultured mussels, determine Ohio and Allegheny River restoration potential via silo studies or small, permanent monitoring plots.	Other state agency, Pennsylvania Fish and Boat Commission
2	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Other state agency, Other federal agency, U.S. Fish and Wildlife Service
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Pimpleback

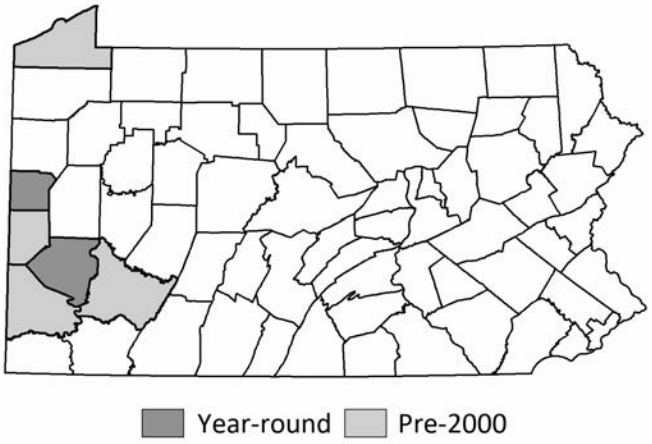
Pustulosa pustulosa

Nevin T. Welte — *Pennsylvania Fish and Boat Commission*



D. Biggins, U.S. Fish and Wildlife Service, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine species status and recovery potential.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** Medium

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Pimpleback conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Very High - High

Specific Threat: Impacts of dams.

Action Category: Manage non-living habitat components

Specific Action: Work with willing dam owners to provide fish passage or remove large dams to benefit freshwater mussel populations and their associated host fishes.

Objective: Increase host fish passage and host fish access to natural stream and river habitats to sustain or expand mussel populations.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of stream miles restored.

Potential Collaborators: Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Lower Allegheny, Mid. Allegheny-Redbank

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** Very High

Specific Threat: Wastewater treatment plants and associated effluents, along with risk of potential pollution event.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Pimpleback conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

Locations: HUC8 Watershed: U. Ohio

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High

Specific Threat: Invasive mussels (Zebra Mussels) may impact this species.

Action Category: Outreach, communication and distribution

Specific Action: Communicate importance of cleaning boats, bilges, and fishing gear to prevent Zebra Mussel spread.

Objective: Provide boaters and recreational anglers information regarding cleaning boats, gear.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Number of people reached.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Using translocated or propagated and cultured mussels, determine Ohio and Allegheny River restoration potential via silo studies or small, permanent monitoring plots.	Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations
2	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Geological Survey, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Conduct additional Ohio and Allegheny River mussel surveys to document new occurrences and potentially suitable habitat.	Conservancies & Land Trusts, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

No known monitoring programs.

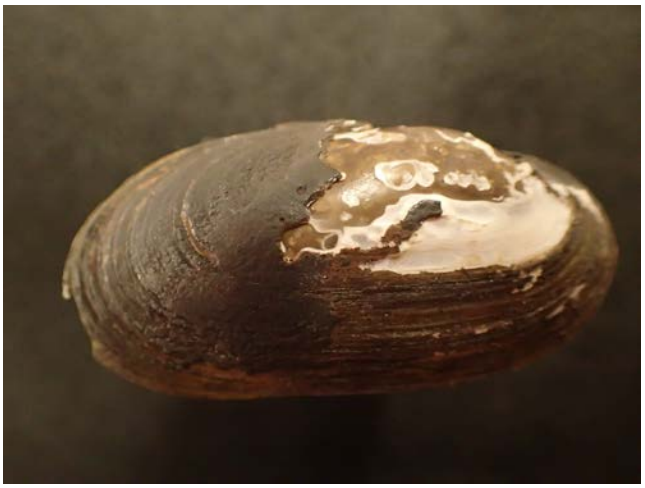
No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Salamander Mussel

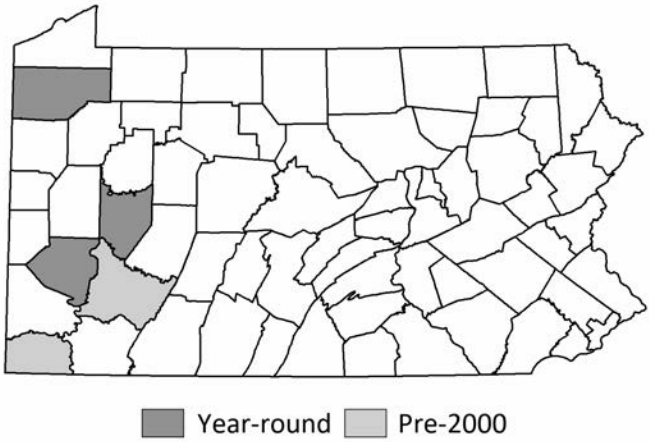
Simpsonaias ambigua

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



N. Welte, Western Pennsylvania Conservancy

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Salamander Mussel in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G1G2

IUCN Red List Designation: Vulnerable

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Proposed Endangered

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Large rivers with shelter rock.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Mining and Quarrying

Threat Impact: Very High - High

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Number of permits reviewed associated with Salamander Mussel conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta, French

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops

Threat Impact: Medium - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 3-Medium

Action Urgency: Initiate immediately

Measure: Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Chautauqua-Conneaut, French, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny, Lower Monongahela, U. Ohio

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** High - Low

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed wastewater discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Salamander Mussel conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: French, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Monongahela, U. Ohio, Lower Allegheny

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Salamander Mussels. Conduct Common Mudpuppy host trials, to determine appropriate captive care and increase the number of transformed juvenile Salamander Mussels.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Experiment with the use of artificial habitat for Mudpuppy (Necturus maculosus) host and for Salamander Mussels. Using propagated and cultured mussels, determine restoration potential via silo studies or small, permanent monitoring plots.	Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Conservation and Natural Resources, U.S. Fish and Wildlife Service
3	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan. Assist PFBC with Pennsylvania-specific species recovery goals outlined in Species Action Plans.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Universities & research institutions
4	Determine TFM lampricide toxicity to all Salamander Mussel life stages to inform Conneaut Creek Sea Lamprey lampricide treatment regimes.	U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Environmental Protection Agency, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection
5	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct Conneaut Creek Salamander Mussel surveys, incorporate use of eDNA detection methods.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service
2	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
3	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

Name: Conneaut Creek Salamander Mussel and Mudpuppy lampricide treatment monitoring

Lead(s) : PFBC, PADEP

Link: N/A

Description: Develop a monitoring plan to evaluate the effects of lampricide treatment on the distribution of Salamander Mussels and their hosts, the Common Mudpuppy.

Name: Salamander Mussel restoration monitoring

Lead(s) : PFBC

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Name: Salamander Mussel status monitoring

Lead(s) : PFBC

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

PFBC 2023. Species Action Plan: Salamander Mussel (Simpsonaias ambigua).

PENNSYLVANIA WILDLIFE ACTION PLAN

Lilliput

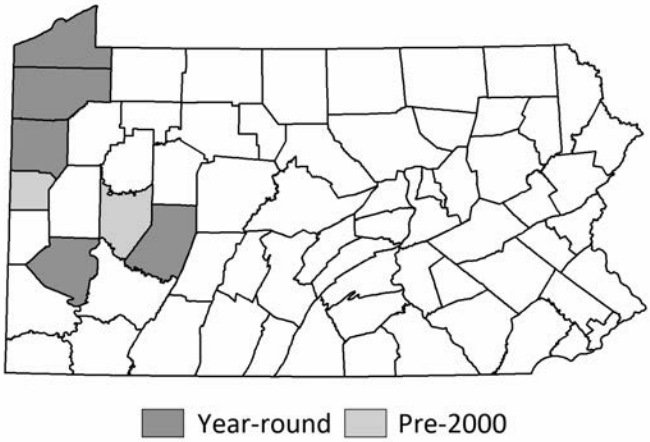
Toxolasma parvum

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



Naturalis Biodiversity Center, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Warm, Small River

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** Medium - Low

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed wastewater discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Lilliput conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Shenango, French, Chautauqua-Conneaut, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** Medium - Low

Specific Threat: Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Lilliput conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Chautauqua-Conneaut, French, Shenango, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny, U. Ohio, Lower Monongahela

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Conduct surveys to determine status of Lilliput in Pymatuning Reservoir and other slow-moving or silty Shenango River and French Creek tributaries.	Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Conservation and Natural Resources
2	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
4	Conduct Delaware River basin surveys to assess potential interbasin transfers.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Delaware River Basin Commission
5	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

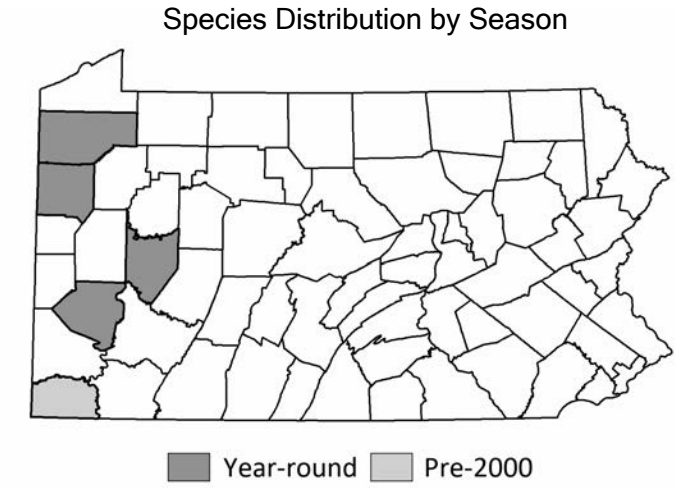
Pistolgrip

Quadrula verrucosa

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



M. Walsh, Western Pennsylvania Conservancy



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Pistolgrip in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Medium rivers. Habitat in the form of large woody debris or shelter rock habitat is conducive for Flathead Catfish habitat, thus benefiting the Pistolgrip.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** High

Specific Threat: Variable flows due to Pymatuning Dam operations.

Action Category: Manage non-living habitat components

Specific Action: Manage water flows to minimize and avoid risks to Shenango River mussel population.

Objective: Maintain Pymatuning Reservoir discharges at 40 cubic feet per second or greater.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Daily discharge from Pymatuning Reservoir not less than 40 cubic feet per second.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Shenango

Other species likely to benefit from this action: All Shenango River mussel species.

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Pistolgrip conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Shenango, Mid. Allegheny-Redbank

Other species likely to benefit from this action: Other riverine mussel species.

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Lower Monongahela, U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta, Shenango, Beaver

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High

Specific Threat: Risk of an oil or gas spill, or industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Pistolgrip conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Shenango, Mahoning, Beaver, U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Pistolgrips. Conduct host fish trials, if necessary. Develop protocols for population augmentation via streamside infestations.	Pennsylvania Fish and Boat Commission
2	Assist PFBC with species recovery goals outlined in Species Action Plans.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions
3	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey
4	Determine a federal water quality standard for chloride that is protective of this species.	Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, U.S. Environmental Protection Agency

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Determine the extent of Pistolgrip distribution in the Beaver River, if any.	Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Conservancies & Land Trusts, Non-governmental organizations
3	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
4	Conduct Flathead Catfish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
5	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

Name: Pistolgrip restoration monitoring **Lead(s) :** PFBC

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Monitoring Need: Develop a monitoring program for Pistolgrip stocked into Dunkard Creek, Ohio River, Allegheny River.

Name: Pistolgrip status monitoring **Lead(s) :** PFBC

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

PFBC (2023) - Species Action Plan: Pistolgrip (Tritogonia verrucosa)

PENNSYLVANIA WILDLIFE ACTION PLAN

Fawnsfoot

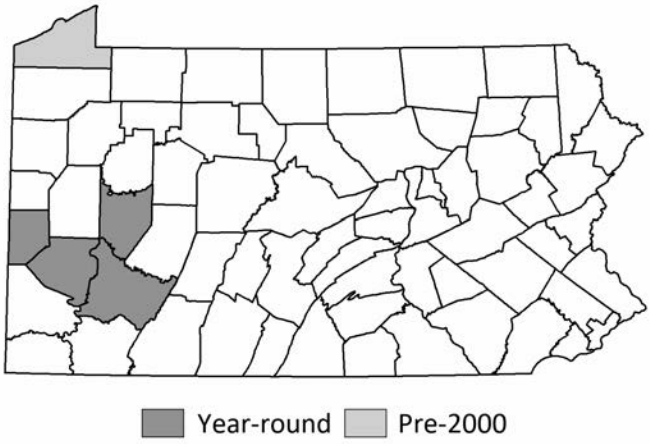
Truncilla donaciformis

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying

Threat Impact: Very High - Medium

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Number of permits reviewed associated with Fawnsfoot conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents

Threat Impact: High - Low

Specific Threat: Potential industrial accident and wastewater treatment plants effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of permits reviewed associated with Fawnsfoot conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Monongahela, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta, French

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops

Threat Impact: Very High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 3-Medium

Action Urgency: Initiate immediately

Measure: Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Chautauqua-Conneaut, French, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny, Lower Monongahela, U. Ohio

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Deertoe

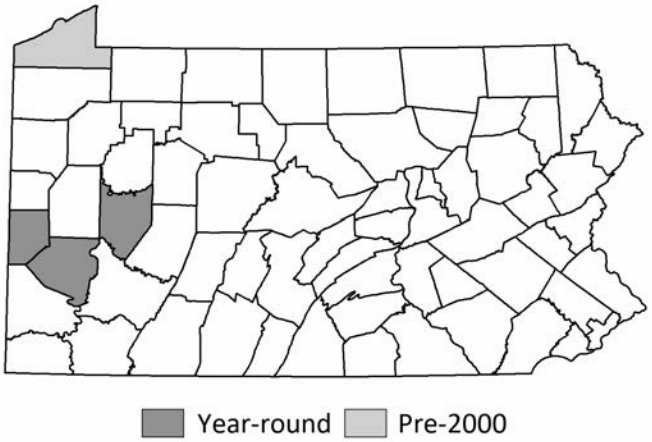
Truncilla truncata

Nevin T. Welte *Pennsylvania Fish and Boat Commission*



D. Biggins, U.S. Fish and Wildlife Service, via Wikimedia Commons

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - High

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Mining and Quarrying

Threat Impact: Very High - Medium

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Number of permits reviewed associated with Deertoe conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Domestic and Urban Waste Water

Threat Impact: High - Low

Specific Threat: Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed wastewater discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of permits reviewed associated with Deertoe conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Lower Monongahela, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta, Chautauqua-Conneaut

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Low

Specific Threat: Risk of an industrial accident.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Deertoe conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: Chautauqua-Conneaut, U. Ohio, Lower Monongahela, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Very High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 3-Medium **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Private Landowners, Township Zoning Boards, U.S. Army Corps of Engineers, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: U. Ohio, Lower Monongahela, Lower Allegheny, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta, Chautauqua-Conneaut

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection
2	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
3	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions
4	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Conservancies & Land Trusts, Non-governmental organizations

Name: Deertoe status monitoring **Lead(s) :**

Link: N/A

Description:

Monitoring Need: Monitor species strongholds to establish baseline species status for trend analysis.

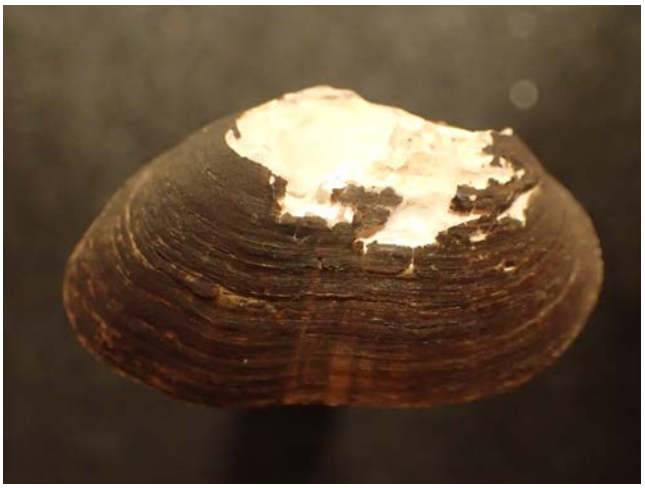
No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

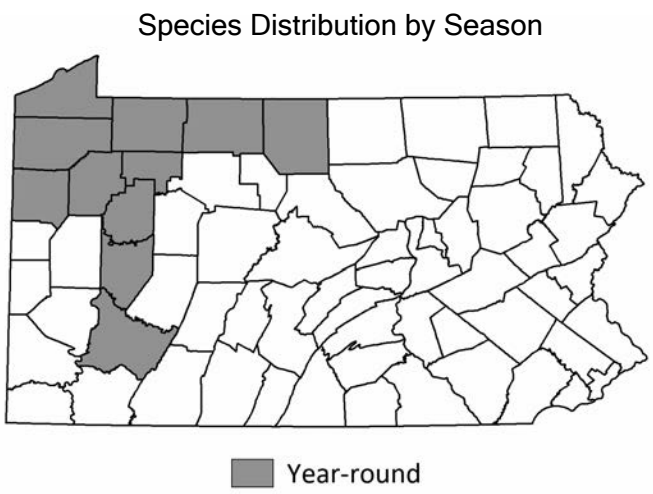
Rayed Bean

Paetulunio fabalis

Nevin T. Welte — *Pennsylvania Fish and Boat Commission*



N. Welte, Western Pennsylvania Conservancy



Conservation Profile

PA 10-Year Conservation Goal: Maintain and protect extant populations of Rayed Bean in the Commonwealth and provide sufficient distribution to adequately secure the species and allow its removal from the Pennsylvania list of endangered species.

NatureServe Global Rank: G2

IUCN Red List Designation: Endangered

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Endangered

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Endangered

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: Medium rivers.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Low Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High

Specific Threat: Commercial sand and gravel, navigational channel maintenance, and regular maintenance dredging.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of commercial and navigational sand and gravel dredging on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed dredging activities.

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Rayed Bean conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: U. Ohio, Lower Allegheny, Lower Monongahela, Mid. Allegheny-Redbank, Mid. Allegheny-Tionesta

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: French, Conewango, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny, Shenango, U. Allegheny

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Medium

Specific Threat: Risk of an oil or gas spill and impacts of brine discharge (chlorides). Wastewater treatment plants and associated effluents.

Action Category: Complementary or alternative conservation measures

Specific Action: Conduct environmental review to examine potential effects of proposed industrial effluent discharges on freshwater mussels and their habitats.

Objective: Avoid or minimize harm to freshwater mussels potentially affected by proposed or existing discharge facilities.

Action Priority: 2-High **Action Urgency:** Initiate immediately **Measure:** Number of permits reviewed associated with Rayed Bean conflicts or known locations.

Potential Collaborators: Businesses, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service

Locations: HUC8 Watershed: French, Shenango, Mid. Allegheny-Tionesta, U. Allegheny, Conewango, Mid. Allegheny-Redbank, Lower Allegheny

Other species likely to benefit from this action:

Season: Year-round

Threat Category: Habitat Shifting or Alteration **Threat Impact:** High - Medium

Specific Threat: Reduction of wetted habitat or shifting of occupied habitat due to climate change-driven droughts and/or floods paired with increased erosion.

Action Category: Outreach, communication and distribution

Specific Action: Discuss the potential climate change effects on Rayed Bean and host fish to generate public awareness.

Objective: Increase public interactions with the Allegheny River, its species, and identify ways individuals can contribute to mussel conservation in a changing climate.

Action Priority: 4-Low **Action Urgency:** Initiate within 5 years **Measure:** Number of people reached.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Locations: HUC8 Watershed: U. Allegheny, Conewango, French, Mid. Allegheny-Tionesta, Mid. Allegheny-Redbank, Lower Allegheny, Shenango

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Rayed Bean. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
2	Where appropriate, use translocated or propagated mussels to determine restoration potential via silo studies or small, permanent monitoring plots.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission
3	Assist USFWS with range-wide species recovery goals outlined in federal recovery plan. Assist PFBC with Pennsylvania-specific species recovery goals outlined in Species Action Plans.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service, U.S. Geological Survey
4	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey
5	Determine a federal water quality standard for chloride that is protective of this species.	U.S. Environmental Protection Agency, Pennsylvania Department of Environmental Protection

Season: Year-round

Priority	Survey	Partners
1	Continue Allegheny and Ohio River navigational pool mussel surveys to determine extent of species distribution.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations
2	Conduct additional surveys in the upper Allegheny River basin to determine extent of species distribution in the Allegheny River, Oswayo Creek, Honeoye Creek, and potentially Potato Creek.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
3	Conduct additional qualitative surveys of Cussewago Creek near Meadville and Conewango Creek near Russell, Pennsylvania.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
4	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, U.S. Fish and Wildlife Service
5	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Pennsylvania Department of Environmental Protection, Non-governmental organizations, Conservancies & Land Trusts

Name: Rayed Bean restoration monitoring **Lead(s) :**

Link: N/A

Description: Develop a monitoring program and database to evaluate the efficacy, techniques, and outcomes of ongoing and future translocation, augmentation, and reintroduction efforts.

Name: Rayed Bean status monitoring **Lead(s) :**

Link: N/A

Description: Develop and implement a quantitative or semi quantitative monitoring program and protocol to estimate temporal population trends for the evaluation of species recovery and status.

Clark, K.H., Iwanowicz, D.D., Iwanowicz, L.R., Mueller, S.J., Wisor, J.M., Bradshaw-Wilson, C., Shill, W.B., Stauffer, Jr., J.R., and E.W. Boyer. 2022. Freshwater unionid mussels threatened by predation of Round Goby (Neogobius melanostomus). Scientific Reports. 12:12859. https://doi.org/10.1038/s41598-022-16385-y

Pennsylvania Fish and Boat Commission. 2022. Climate Action Plan: Strategies for enhancing climate adaptation and resilience to protect, conserve, and enhance Pennsylvania's aquatic resources and support anglers and boaters, version 2022-1.0. Harrisburg, Pennsylvania.

PFBC. 2025. Species Action Plan: Rayed Bean (Paetelunio fabalis).

U.S. Fish and Wildlife Service. 2024. Recovery Plan for Four Species of Freshwater Mussels: Rayed Bean (Villosa fabalis), Sheepnose (Plethobasus cyphyus), Snuffbox (Epioblasma triquetra), and Spectaclecase (Cumberlandia monodonta). Bloomington, Minnesota.

PENNSYLVANIA WILDLIFE ACTION PLAN

Rainbow

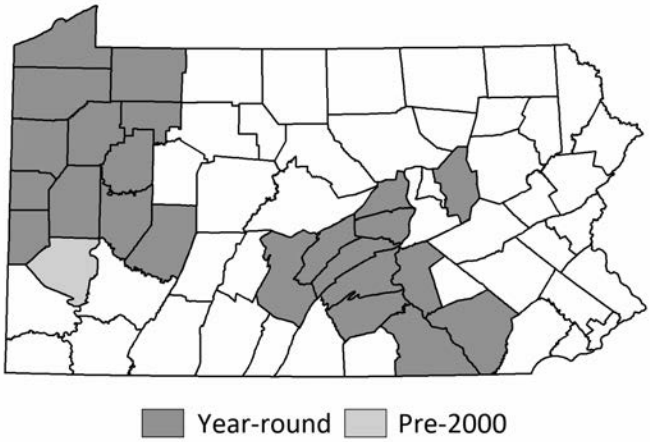
Cambarunio iris

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Warm, Medium River

Habitat Comments: The Rainbow can occasionally be found underneath large, flat stones that are easily lifted by hand. These rocks may serve as refugia for host fishes although the actual relationships between these rock habitat features and the Rainbow are not entirely understood.

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: HUC8 Watershed: Chautauqua-Conneaut, French, Shenango, Conewango, U. Allegheny, Mid. Allegheny-Tionesta, Clarion, Mid. Allegheny-Redbank, Connoquenessing, U. Ohio, Lower Allegheny, Kiskiminetas, Lower Susquehanna-Swatara, Lower Susquehanna, Lower Juniata

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Determine potential genetic origin of Susquehanna River basin Rainbow mussels and development genetic conservation management unit, if warranted.	Other federal agency, Universities & research institutions, Pennsylvania Fish and Boat Commission
2	Develop propagation and culture technologies for producing Rainbow mussels. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	If genetic data determines that Susquehanna Rainbows are native, i.e., distinct from the Ohio River basin, then conduct additional Susquehanna River basin surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Susquehanna River Basin Commission, Pennsylvania Fish and Boat Commission
2	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission

Name: Rainbow - Clarion River restoration monitoring **Lead(s) :** PFBC

Link: N/A

Description: Develop and implement long-term monitoring plan and database to assess Clarion River mussel recovery efforts using propagated mussels and translocated adults from Allegheny River source populations.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Wavyrayed Lampmussel

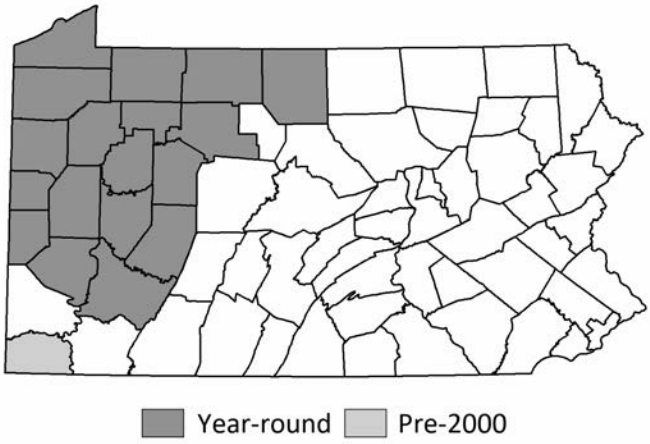
Lampsilis fasciola

Nevin T. Welte ***Pennsylvania Fish and Boat Commission***



Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain species populations.

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Not RSGCN

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium - Low

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: HUC8 Watershed: Chautauqua-Conneaut, French, Shenango, Connoquenessing, Mid. Allegheny-Tionesta, U. Allegheny, Conewango, Clarion, Mid. Allegheny-Redbank, Lower Allegheny, U. Ohio, Beaver, Mahoning, U. Ohio-Wheeling, Lower Monongahela, Cheat, Youghiogheny, Kiskiminetas, Conemaugh

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Develop propagation and culture technologies for producing Wavyrayed Lampmussel and other members of the Lampsilis genus. Conduct host fish trials, if necessary, to ascertain a suite of suitable wild host fishes and production host fishes.	Pennsylvania Fish and Boat Commission
2	Using translocated or propagated and cultured mussels, determine restoration potential via silo studies or small, permanent monitoring plots.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
3	Collaborate with partners on species genetics projects.	Conservancies & Land Trusts, Non-governmental organizations, Other state agency, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions, U.S. Fish and Wildlife Service, U.S. Geological Survey

Season: Year-round

Priority	Survey	Partners
1	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: Wavyrayed Lampmussel – Clarion River restoration monitoring **Lead(s) :** PFBC

Link: N/A

Description: Develop and implement long-term monitoring plan and database to assess Clarion River mussel recovery efforts using translocated adults from Allegheny River source populations.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Atlantic Spike

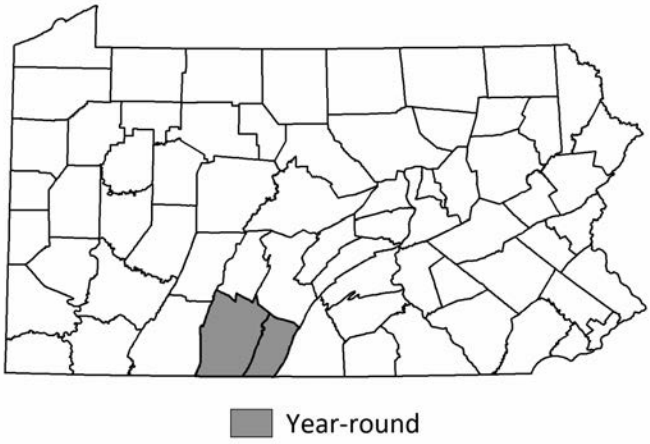
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Nevin T. Welte *Pennsylvania Fish and Boat Commission*



Pennsylvania Fish and Boat Commission

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain existing Potomac River headwater populations.

NatureServe Global Rank: G3

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN: Data Deficient

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: High

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: Unknown

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: High Gradient, Warm, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** High - Medium

Specific Threat: Impacts to stream habitats from sedimentation associated with agriculture/livestock practices.

Action Category: Manage non-living habitat components

Specific Action: Restore or maintain forested or well-vegetated habitats along rivers and streams.

Objective: Increase by 10% over 10 years, the forested or vegetative cover along streams inhabited by this species.

Action Priority: 2-High **Action Urgency:** Initiate within 5 years **Measure:** Number of acres of forested or vegetative buffer.

Potential Collaborators: Businesses, Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Association of Conservation Districts, Pennsylvania Department of Environmental Protection, Private Landowners, U.S. Department of Agriculture-Natural Resources Conservation Service, Universities & research institutions

Locations: HUC8 Watershed: Conococheague-Opequon, Monocacy, Cacapon-Town, N. Br. Potomac

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Research Elliptio species complex to determine which Elliptio species occur in the upper Potomac and Delaware (e.g., E. complanata vs. E. fisheriana vs. E. producta).	Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Conduct surveys to determine the extent of species Pennsylvania distribution and identify potential species restoration areas	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission
2	Conduct host fish surveys to determine host fish presence and abundance within the mussel species known or historical Pennsylvania range.	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Other state agency, Pennsylvania Department of Environmental Protection, Universities & research institutions
3	Maintain up-to-date species occurrence records. Species occurrence records greater than or equal to 25 years old are survey priorities.	Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations

Name: Atlantic Spike status monitoring **Lead(s) :** PFBC

Link: N/A

Description: Establish long-term mussel monitoring sites in Sideling Hill Creek, Town Creek, and Tonoloway Creek.

Monitoring Need: Monitor species strongholds to establish baseline species status for trend analysis.

Pennsylvania Fish and Boat Commission. 2022. Climate Action Plan: Strategies for enhancing climate adaptation and resilience to protect, conserve, and enhance Pennsylvania's aquatic resources and support anglers and boaters, version 2022-1.0. Harrisburg, Pennsylvania.

PENNSYLVANIA WILDLIFE ACTION PLAN

Lance Aplexa

Aplexa elongata

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation:

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status:

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation:

PA Abundance: Unknown

PA Short-term Trend (10-year):

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Wet ditches

Primary Habitat: Palustrine

Primary Habitat Type: Vernal Pools/Ephemeral Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Unknown

Specific Threat: Conversion of natural areas to residential and other development

Action Category: Conservation planning

Specific Action: Create a conservation plan for aquatic snails and vernal pool invertebrates

Objective: One conservation plan created

Action Priority: **Action Urgency:** Initiate within 5 years **Measure:** Conservation plan created

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Identify threats to habitat and species	Conservancies & Land Trusts, Universities & research institutions, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat studies	Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative surveys

Monitoring Need: Monitoring of vernal pool snail populations to establish population trends.

Freshwater Gastropods of North America

Turner, A.M., and S.L. Montgomery. 2009. Hydroperiod, predators and the distribution of physid snails across the freshwater habitat gradient. Freshwater Biology 54, 1189–1201

PENNSYLVANIA WILDLIFE ACTION PLAN

Globe Siltsnail

Birgella subglobosus

Mary Walsh *Western Pennsylvania Conservancy*



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** High - Medium

Specific Threat: Changes to flow regime

Action Category: Conservation planning

Specific Action: Create a conservation plan for aquatic snails in large rivers

Objective: Determine habitat needs and threats in large rivers for aquatic snails.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Create a management plan for aquatic snails.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic snails

Season: Year-round

Threat Category: Industrial and Military Effluents **Threat Impact:** High - Medium

Specific Threat: Abandoned Mine Drainage (AMD)

Action Category: Conservation planning

Specific Action: Create a conservation plan for riverine snails.

Objective: Determine habitat needs and threats in large rivers for aquatic snails.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Create a management plan for aquatic snails.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other large river snails

Season: Year-round

Threat Category: Shipping Lanes **Threat Impact:** High - Medium

Specific Threat: Dredging

Action Category: Conservation planning

Specific Action: Create a plan to address disturbances and manage habitat in large rivers.

Objective: Determine habitat needs and threats in large rivers for aquatic snails.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Create a management plan for aquatic snails.

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other riverine aquatic snails

Season: Year-round

Priority	Need	Partners
1	Identify threats to habitat and species	Non-governmental organizations, Universities & research institutions, Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts

Season: Year-round

Priority	Survey	Partners
1	Additional distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: None known **Lead(s) :**

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of riverine populations to establish population trends.

Freshwater Gastropods of North America website

PENNSYLVANIA WILDLIFE ACTION PLAN

Watercress Snail

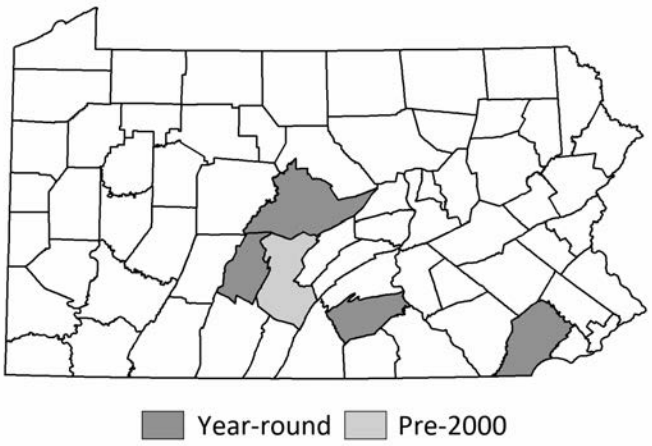
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Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Limestone springs, streams and caves

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cold, Headwaters and Creeks

Habitat Comments: Limestone springs, streams and caves

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** Medium

Specific Threat: Road runoff

Action Category: Manage non-living habitat components

Specific Action: Manage storm water runoff and road run off through BMPs

Objective: Ameliorate habitat and water quality degradation

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Delaware River Basin Commission, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Private Landowners, Universities & research institutions

Locations: HUC8 Watershed: Bald Eagle, U. Juniata, Lower Susquehanna-Swatara, Schuylkill

Other species likely to benefit from this action: Other limestone stream species

Season: Year-round

Priority	Need	Partners
1	Identify threats to habitat and species	Universities & research institutions, Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat studies	Non-governmental organizations, Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

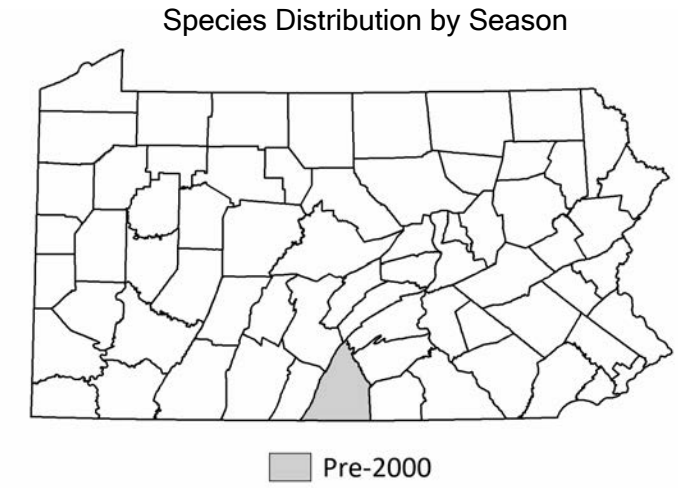
Blue Ridge Springsnail

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Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3

IUCN Red List Designation: Data Deficient

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: springs and caves

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Domestic and Urban Waste Water

Threat Impact: High - Low

Specific Threat: Road runoff

Action Category: Manage non-living habitat components

Specific Action: Manage storm water runoff and road run off through BMPs

Objective: Ameliorate habitat and water quality degradation

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Pennsylvania Department of Environmental Protection, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC8 Watershed: Conococheague-Opequon

Other species likely to benefit from this action: Other spring species

Season: Year-round

Priority	Need	Partners
1	Identify threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat studies	Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Non-governmental organizations, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Flexed Gyro

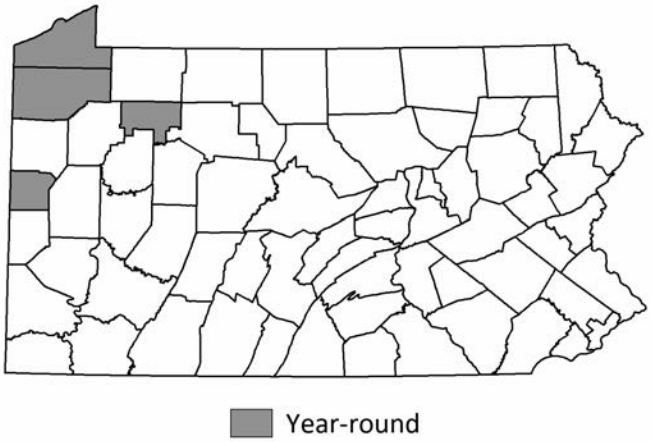
Gyraulus deflectus

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Oligotrophic, Medium Alkalinity Lake

Season: Year-round

Threat Category: Livestock Farming and Ranching

Threat Impact: Medium - Low

Specific Threat: Runff and organic enrichment of waterways

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for streamside agriculture

Objective: Improve stream habitat and water quality in stream habitats that is degraded by agriculture

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC8 Watershed: French, Mid. Allegheny-Tionesta, Shenango

Other species likely to benefit from this action: other stream species

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat studies	

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Woodland Pondsnail

Ladislavella catascopium

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Lakes, medium to large rivers, and sometimes marshes

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Storms and Flooding **Threat Impact:** Medium - Low

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create plan to mitigate threats from hydrologic and temperature changes to aquatic snails

Objective: Identify actions for mitigating climate change for aquatic snails

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Conservation plan created

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC8 Watershed: Lower Susquehanna, Crosswicks-Neshaminy, Mid. Delaware-Musconetcong, Mid. Delaware-Mongaup-Brodhead

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

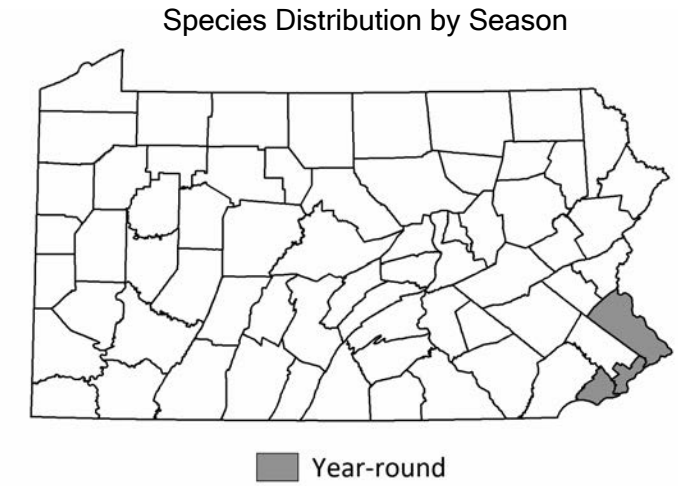
Henscomb Hydrobe

Littoridinops tenuipes

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Domestic and Urban Waste Water

Threat Impact: Medium

Specific Threat: Road runoff

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for wastewater

Objective: Improve stream habitat and water quality in stream habitats that is degraded by wastewater

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC8 Watershed: Lower Delaware

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Threat Category: Habitat Shifting or Alteration

Threat Impact: High - Medium

Specific Threat: Altered hydrology.

Action Category: Conservation planning

Specific Action: Create plan to mitigate threats from hydrologic and temperature changes to aquatic habitats

Objective: Identify actions for mitigating climate change for vernal pools in a plan

Action Priority: 1-Highest

Action Urgency: Initiate immediately

Measure: Conservation plan created

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic snails

Season: Year-round

Threat Category: Shipping Lanes **Threat Impact:** High

Specific Threat: Dredging

Action Category: Conservation planning

Specific Action: Create a conservation plan for riverine snails.

Objective: Determine habitat needs and threats in large rivers for aquatic snails.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Create a management plan for aquatic snails.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic snails

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Universities & research institutions, Pennsylvania Fish and Boat Commission, Non-governmental organizations

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Swamp Lymnaea

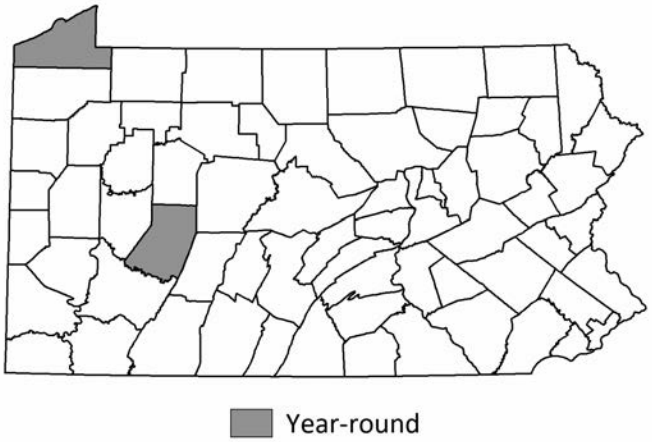
Lymnaea stagnalis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Mesotrophic, Medium Alkalinity Lake

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat:

Primary Habitat Type:

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Livestock Farming and Ranching **Threat Impact:** Low

Specific Threat: Sediment and nutrients, from livestock access to streams and from farm runoff.

Action Category: Manage non-living habitat components

Specific Action: Implement BMPs for wastewater and runoff

Objective: Improve stream habitat and water quality in stream habitats that is degraded by agriculture

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC8 Watershed: Conemaugh, French

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Non-governmental organizations, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Boreal Marstonia

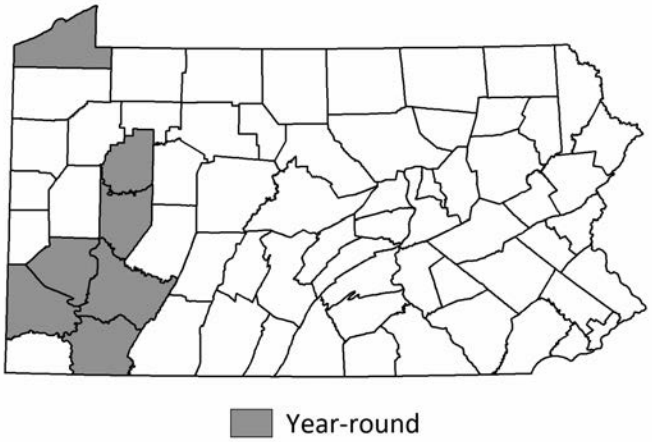
Marstonia lustrica

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years.

NatureServe Global Rank: G4G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Medium

Specific Threat: Runoff from agricultural fields nearby occurrence

Action Category: Manage non-living habitat components

Specific Action: Improve stream habitat and water quality in stream habitats that is degraded by agriculture runoff

Objective: Implement BMPs for agricultural runoff

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Water chemistry, substrate metrics, sedimentation, IBI metrics

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Lower Monongahela, Lower Allegheny, Mid. Allegheny-Redbank, French

Other species likely to benefit from this action:

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Universities & research institutions, Non-governmental organizations

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Vernal Physa

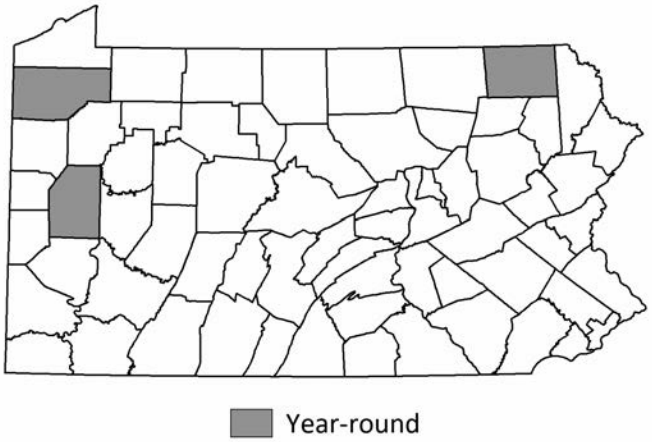
Physa vernalis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Palustrine

Primary Habitat Type: Vernal Pools/Ephemeral Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Industrial and Military Effluents

Threat Impact: Medium

Specific Threat: Abandoned Mine Drainage (AMD)

Action Category: Conservation planning

Specific Action: Create a plan to mitigate surface mining water quality issues (metals) in Muddy Creek

Objective: Improve water quality related to mining

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Create a management plan for aquatic snails.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Connoquenessing

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions, Pennsylvania Fish and Boat Commission

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name:

Lead(s) :

Link:

Description:

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Sprite Elimia

Pleurocera proxima

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium

Specific Threat: Agricultural runoff likely

Action Category: Conservation planning

Specific Action: Create a plan to assess water quality and habitat threats from agriculture and implement appropriate management.

Objective: Determine threats and most applicable management strategies.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Create a management plan for aquatic snails.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Brandywine-Christina

Other species likely to benefit from this action: Other aquatic snails

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Sharp Sprite

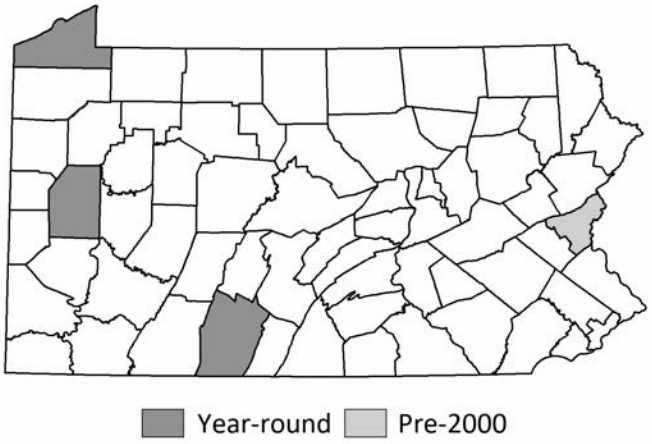
Promenetus exacuous

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cool, Headwaters and Creeks

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium

Specific Threat: Sediment and pesticides

Action Category: Conservation planning

Specific Action: Create a plan to assess water quality and habitat threats from agriculture and implement appropriate management.

Objective: Determine threats and most applicable management strategies.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Create a management plan for aquatic snails.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: HUC8 Watershed: French, Connoquenessing, N. Br. Potomac, U. Susquehanna-Lackawanna

Other species likely to benefit from this action: Other aquatic snails

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name:

Lead(s) :

Link:

Description:

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Ohio Pebblesnail

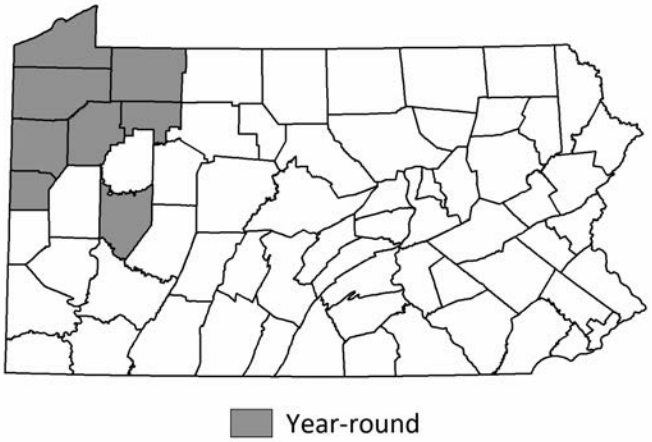
Somatogyrus integra

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium - Low

Specific Threat: Competition from New Zealand Mud Snail and other invasive species.

Action Category: Outreach, communication and distribution

Specific Action: Promote prevention of invasive species introductions through outreach campaigns.

Objective: Prevent invasive species spread by addressing vectors.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of people reached

Potential Collaborators: Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Shale Pebblesnail

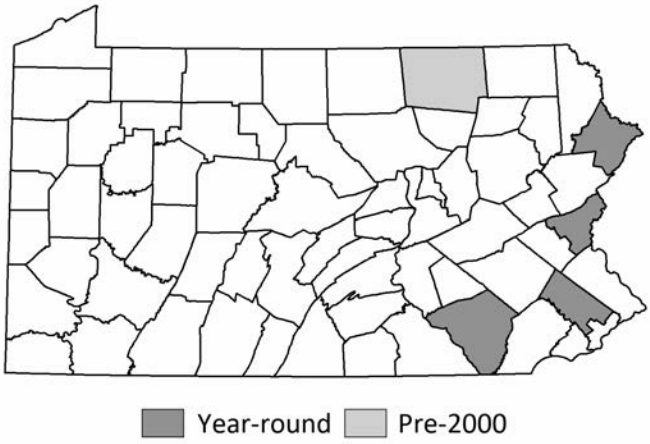
Somatogyrus pennsylvanicus

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G3

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Warm, Small River

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** Medium

Specific Threat: Road runoff

Action Category: Manage non-living habitat components

Specific Action: Implement road run off and stormwater BMPs

Objective: Improve water quality and habitat related to runoff and storm sewers

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** BMPs implemented

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Schuylkill, Lower Susquehanna, Lackawaxen, Lehigh, U. Susquehanna-Tunkhannock

Other species likely to benefit from this action: Other aquatic snails

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Threeridge Valvata

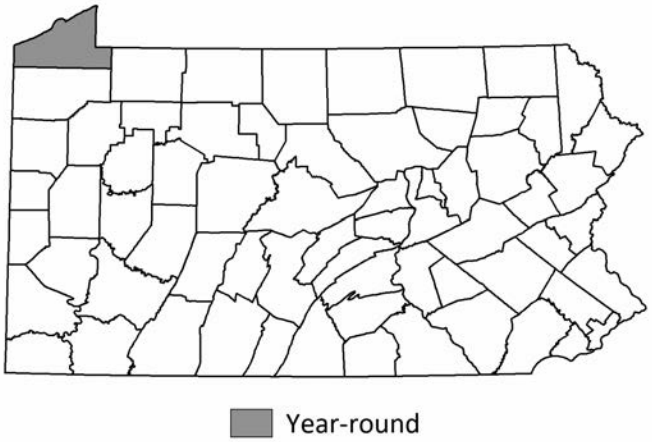
Valvata tricarinata

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Mesotrophic, Medium Alkalinity Lake

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create plan to mitigate threats from hydrologic and temperature changes to aquatic snails

Objective: Identify actions for mitigating climate change for aquatic snails

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Conservation plan created

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic snails

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name:

Lead(s) :

Link:

Description:

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

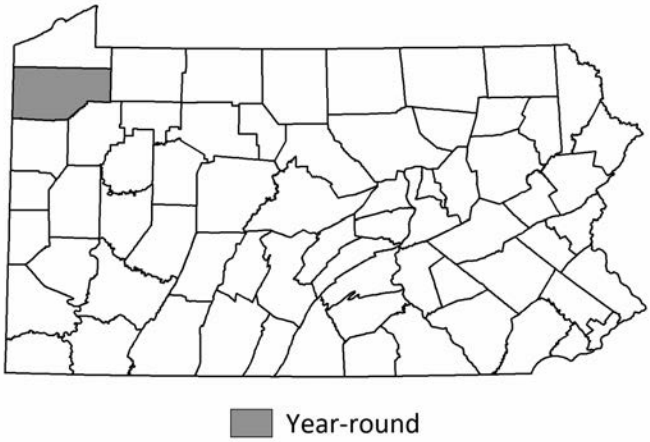
Disk Gyro

Gyraulus circumstriatus

Mary Walsh *Western Pennsylvania Conservancy*



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Vernal ponds

Primary Habitat: Palustrine

Primary Habitat Type: Vernal Pools/Ephemeral Wetlands

Primary Specific Habitat: Unknown

Habitat Comments: Vernal pond

Season: Year-round

Threat Category: Agricultural and Forestry Effluents **Threat Impact:** Medium - Low

Specific Threat: Potential pollution from unmitigated sources in the surrounding uplands (runoff from agriculture, roads, logging)

Action Category: Outreach, communication and distribution

Specific Action: Effective communication of best management practices through successful interaction

Objective: Improve localized land use best practices to support healthy vernal pool habitat through outreach

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Means of communication and number of successful interactions

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Private Landowners

Locations: HUC8 Watershed: Shenango

Other species likely to benefit from this action: Vernal pool species

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium

Specific Threat: Sediment and pesticides

Action Category: Outreach, communication and distribution

Specific Action: Communicate with landowner about best management practices, such as forested buffers around pool.

Objective: Improve localized land use best practices to support healthy vernal pool habitat through outreach

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Effective communication of best management practices through successful interaction.

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Shenango

Other species likely to benefit from this action: Other vernal pool species

Season: Year-round

Threat Category: Logging and Wood Harvesting **Threat Impact:** High

Specific Threat: Potential for logging

Action Category: Outreach, communication and distribution

Specific Action: Communicate with landowner about best management practices.

Objective: Improve localized land use best practices to support healthy vernal pool habitat through outreach

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Effective communication of best management practices through successful interaction

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Shenango

Other species likely to benefit from this action: Vernal pool species

Season: Year-round

Priority	Need	Partners
1	Study distribution in vernal pools and other potential habitats in PA	Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Document distribution and habitats	Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of vernal pool snail populations to establish population trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Midland Siltsnail

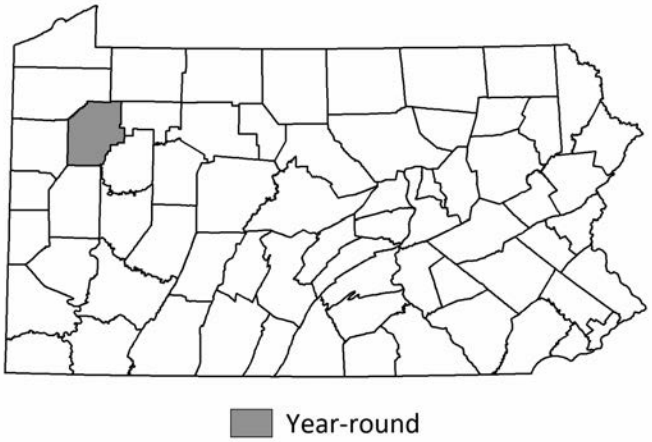
Cincinnatia integra

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Lakes and slow rivers with soft bottoms

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Medium - Low

Specific Threat: Competition from New Zealand Mud Snail

Action Category: Training and individual skill development

Specific Action: Educate the public about invasive species threats and prevention

Objective: Reduce spread of invasive species through public education

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Create materials for education (web materials, presentations, and other information) about invasive species spread

Potential Collaborators: Non-governmental organizations, Pennsylvania Fish and Boat Commission

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Identify threats to habitat and species	Non-governmental organizations, Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Additional distribution and habitat studies	Non-governmental organizations, Pennsylvania Fish and Boat Commission, Conservancies & Land Trusts, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of riverine populations to establish population trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Varicose Rocksnail

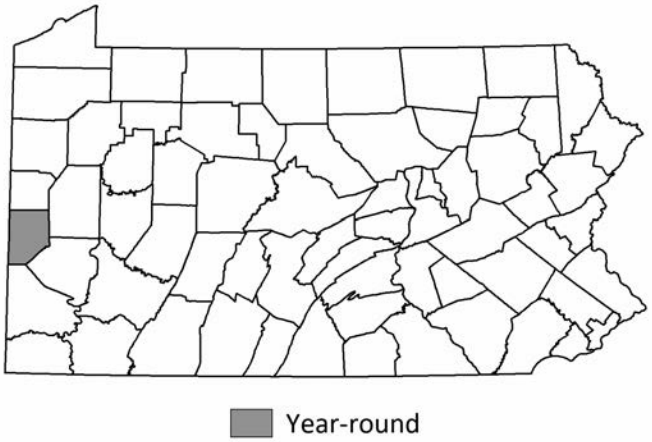
Lithasia verrucosa

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G4

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Decreasing

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: Riffles in medium to large rivers

Primary Habitat: Riverine

Primary Habitat Type: Big Rivers

Primary Specific Habitat: Warm, Large River

Season: Year-round

Threat Category: Shipping Lanes **Threat Impact:** Medium - Low

Specific Threat: Dredging

Action Category: Conservation planning

Specific Action: Create a plan to address disturbances and manage habitat in large rivers.

Objective: Determine habitat needs and threats in large rivers for aquatic snails.

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Create a management plan for aquatic snails.

Potential Collaborators: Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other riverine aquatic snails

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions, Conservancies & Land Trusts

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of riverine populations to establish population trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Thicklip Ramshorn

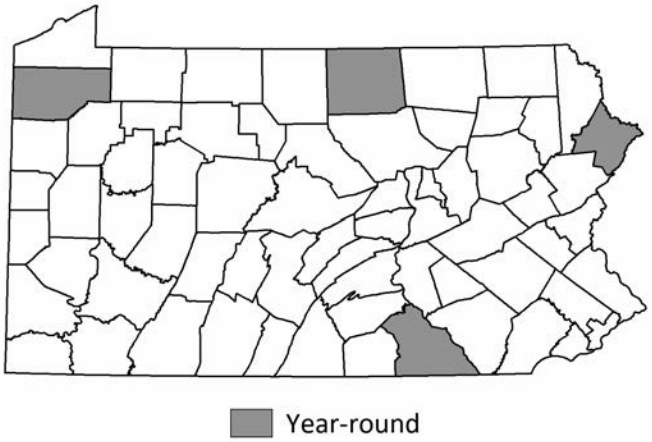
Planorbula armigera

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Marshes, ponds, and slow creeks, especially with macrophytes and dead organic matter.

Primary Habitat: Palustrine

Primary Habitat Type: Vernal Pools/Ephemeral Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Logging and Wood Harvesting

Threat Impact: Medium - Low

Specific Threat: Damage to vernal pools from forestry operations

Action Category: Manage non-living habitat components

Specific Action: Manage pool and riverine sites with appropriate Best Management Practices for buffers to minimize impacts from forestry practices; manage forest habitats.

Objective: Protect supporting habitats for pools and manage potential run off from forestry practices.

Action Priority: 1-Highest

Action Urgency: Initiate within 5 years

Measure: Acres of buffers used in BMPs; number of pools with recommended buffers.

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: Mid. Delaware-Mongaup-Brodhead, Lower Susquehanna, Tioga, Shenango

Other species likely to benefit from this action: Other pool

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Silty Hornsnail

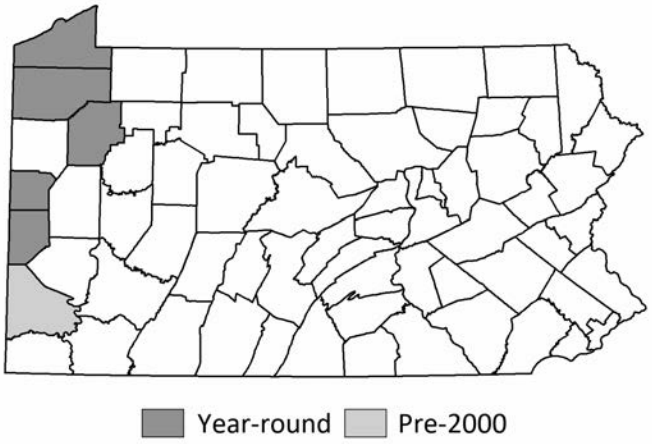
Pleurocera acuta

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Low

Season: Year-round

Specific Habitat Requirements: Rivers and lakes, on a wide variety of substrates

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Mesotrophic, Medium Alkalinity Lake

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Competition from New Zealand Mud Snail

Action Category: Outreach, communication and distribution

Specific Action: Educate natural resource users about ways to prevent the spread of aquatic invasive species through media and educational events.

Objective: Prevent the spread of invasive species through outreach and education

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Number of people reached through outreach

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Department of Environmental Protection, Pennsylvania Fish and Boat Commission, Private Landowners, Universities & research institutions, U.S. Army Corps of Engineers

Locations: Statewide

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Non-governmental organizations, Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Marsh Pondsnail

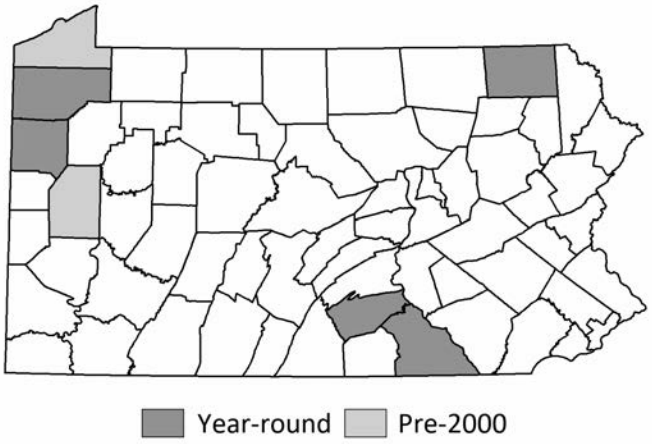
Stagnicola elodes

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Stable

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Lakes, ponds, marshes, and slow-moving waters

Primary Habitat: Lacustrine

Primary Habitat Type: Lakes & Ponds

Primary Specific Habitat: Mesotrophic, Medium Alkalinity Lake

Season: Year-round

Threat Category: Domestic and Urban Waste Water **Threat Impact:** Medium

Specific Threat: Road runoff

Action Category: Manage non-living habitat components

Specific Action: Implement road run off and stormwater BMPs

Objective: Improve water quality and habitat related to runoff and storm sewers

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** BMPs implemented

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations, Pennsylvania Association of Conservation Districts, Pennsylvania Fish and Boat Commission

Locations: HUC8 Watershed: French, Shenango, Lower Susquehanna, Lower Susquehanna-Swatara

Other species likely to benefit from this action: Other aquatic organisms

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Pennsylvania Fish and Boat Commission, Non-governmental organizations, Universities & research institutions

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Bell-mouthed Ramshorn

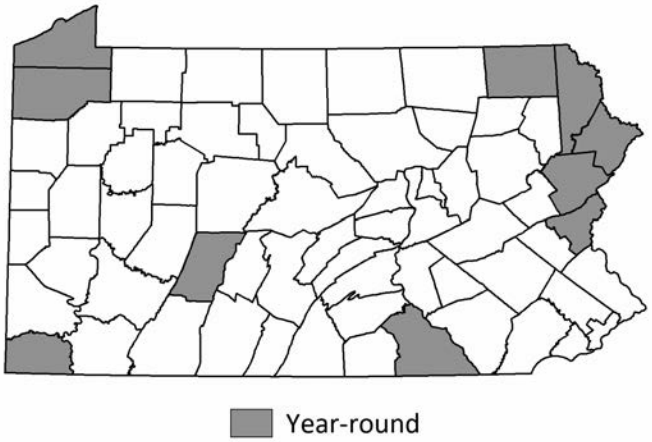
Planorbella campanulata

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Least Concern

IUCN Red List Trend: Unknown

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium - Low

Season: Year-round

Specific Habitat Requirements: Lakes and ponds, especially with hard water

Primary Habitat: Riverine

Primary Habitat Type: Rivers and Streams

Primary Specific Habitat: Moderate Gradient, Cold, Headwaters and Creeks

Season: Year-round

Threat Category: Droughts **Threat Impact:** Medium

Specific Threat: Altered hydrology

Action Category: Conservation planning

Specific Action: Create plan to mitigate threats from hydrologic and temperature changes to aquatic snails

Objective: Identify actions for mitigating climate change for aquatic snails

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Conservation plan created

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Locations: Statewide

Other species likely to benefit from this action: Other aquatic snails

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Fish and Boat Commission, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Conservancies & Land Trusts, Non-governmental organizations, Universities & research institutions, Pennsylvania Fish and Boat Commission

Name: None known

Lead(s) : PFBC

Link: N/A

Description: Qualitative monitoring, to be determined.

Monitoring Need: Monitoring of populations to establish trends.

Freshwater Gastropods of North America

PENNSYLVANIA WILDLIFE ACTION PLAN

Broad-banded Forestsnail

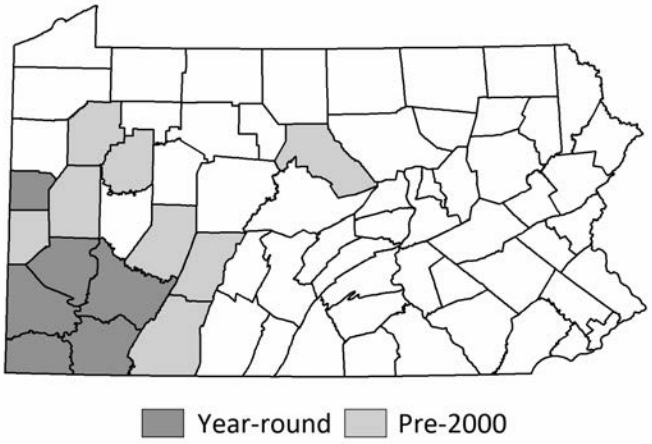
Allogona profunda

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forest, especially with underlying limestone

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Section: Pittsburgh Low Plateau, Waynesburg Hills, Allegheny Mountain, Allegheny Front

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Coastal-plain Tigersnail

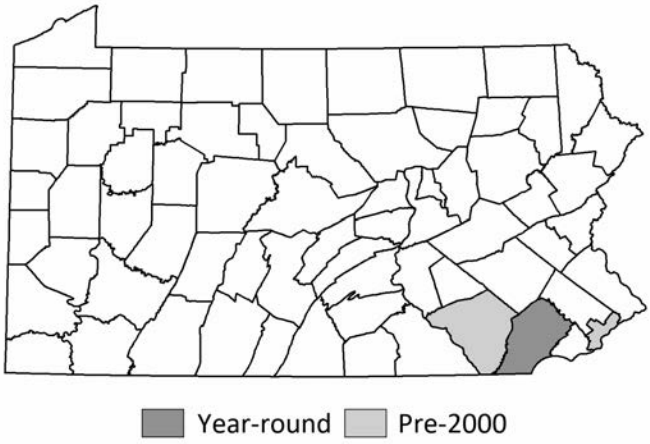
Anguispira fergusoni

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain populations through 2035.

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Coastal and piedmont woods.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Section: Piedmont Upland, Piedmont Lowland, Lowland and Intermediate Upland

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Banded Tigersnail

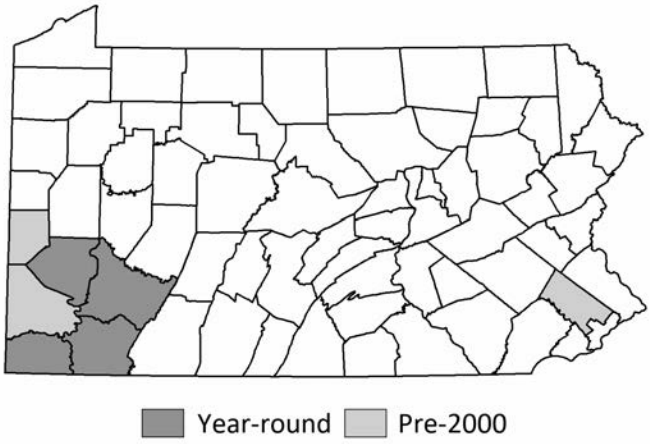
Anguispira kochi

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forest.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau, Allegheny Mountain, Appalachian Mountain, Piedmont Lowland, Piedmont Upland

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Spike-lip Crater

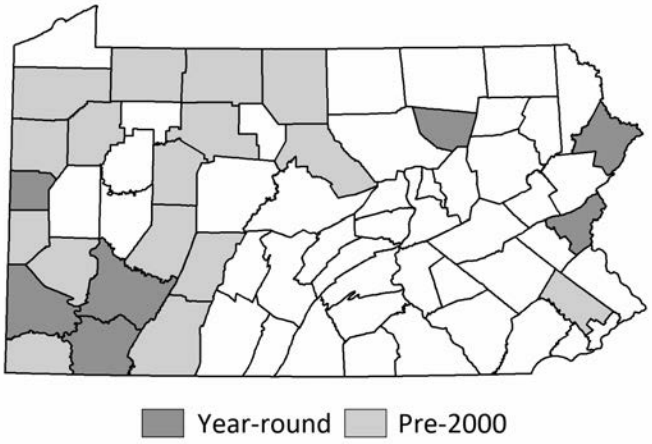
Appalachina sayana

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forest

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Obese Thorn

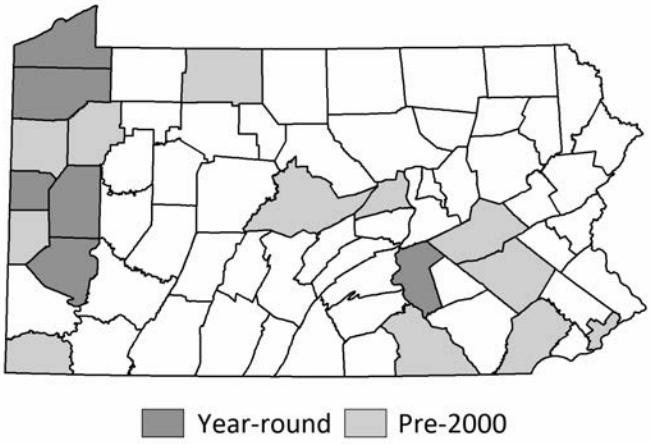
Carychium exiguum

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forest and wetland

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Province: Ridge and Valley, Piedmont, New England. Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau, Northwestern Glaciated Plateau, Eastern Lake, Deep Valleys, Allegheny Mountain, Allegheny Front, Appalachian Mountain

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

File Thorn

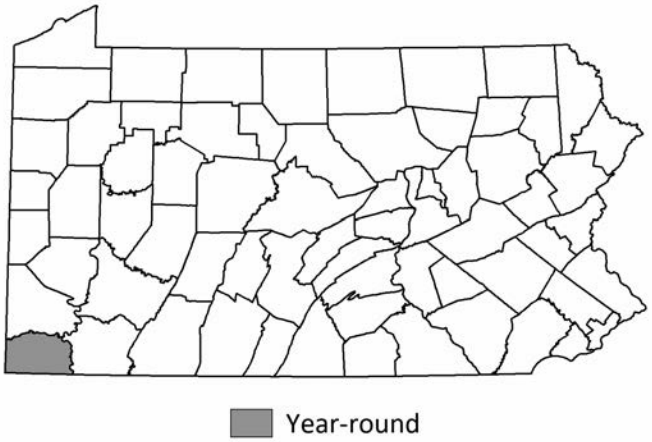
Carychium nannodes

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Rocky, forested areas.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Section: Waynesburg Hills

Other species likely to benefit from this action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites. forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Domed Disc

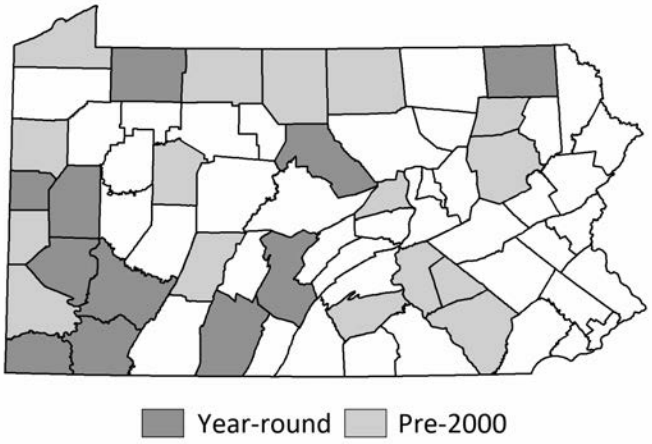
Discus patulus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and improve our understanding of the species' distribution.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: "This species is found under logs and moist leaves in upland deciduous forests, ravines, and river valleys. Rotting logs with loosened bark apparently provide optimal habitat." (MI Natural Features Inventory website). "This species is sometimes found in deep layers of moist leaves, but more commonly on stumps and old logs in mature or late-successional forests. It is often patchy in distribution, with colonies around rotting woody debris. In Tennessee, its occurrence was correlated with increasing slopes, damper soils, and higher soil pH." (Coney et al, 1982, cited in Carnegie MNH website)

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Lowland Pillsnail

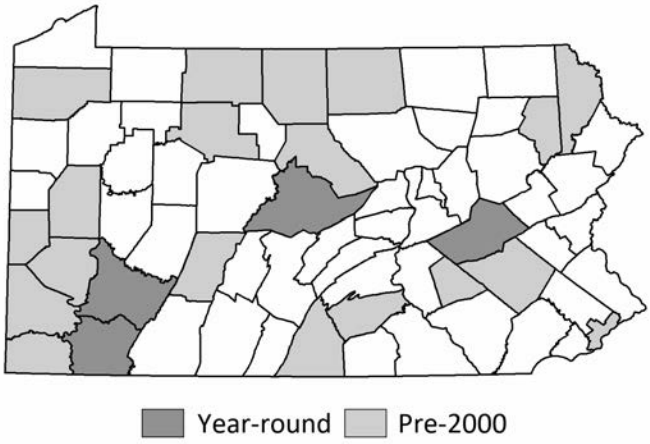
Euchemotrema leai

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Wetlands

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Toothed Hive

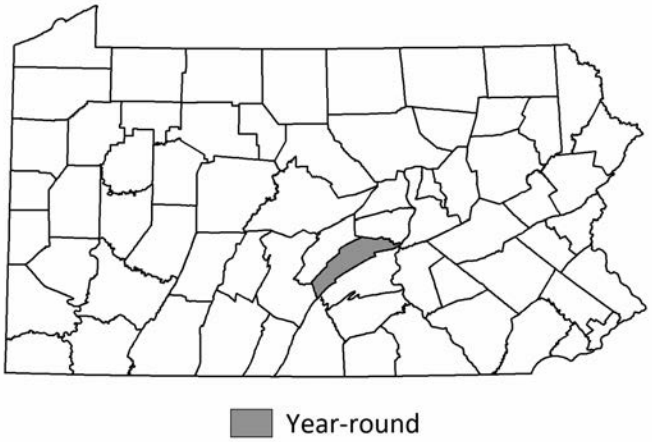
Euconulus dentatus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forest.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Section: Susquehanna Lowland

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Brown Hive

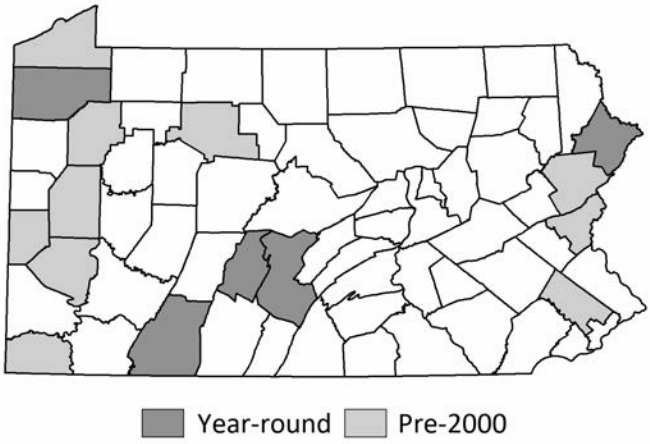
Euconulus fulvus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forest.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority:

Action Urgency:

Measure: Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

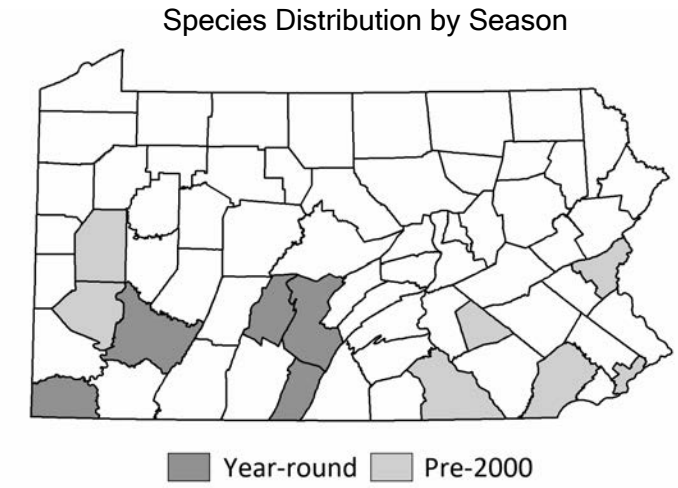
Bark Snaggletooth

Gastrocopta corticaria

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: maintain known populations through 2035, and improve our knowledge of the species' distribution.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forested calcareous outcrops; Eastern red cedar litter, forested wetlands, mature upland forests and glades.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

White Snaggletooth

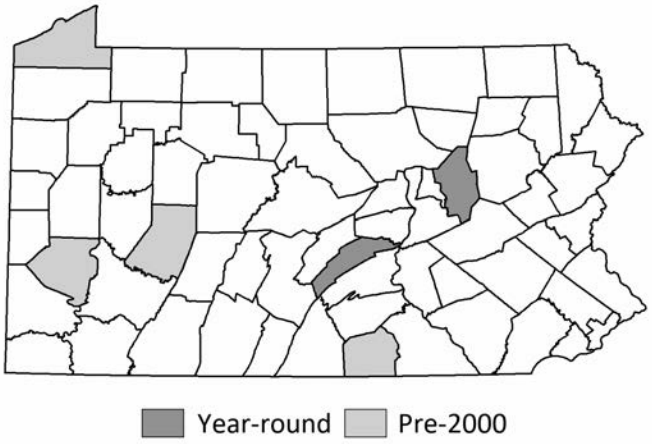
Gastrocopta tappaniana

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Wetlands

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Province: Ridge and Valley, Ridge and Valley, Ridge and Valley. Physiographic Section: Appalachian Mountain, Susquehanna Lowland, Anthracite Upland

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Brown Bellytooth

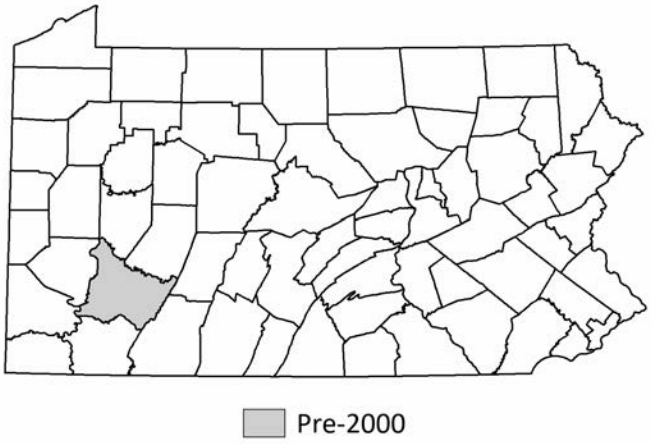
Gastrodonta interna

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Determine if the species is still present in Pennsylvania.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): SH

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Forest.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Low

Specific Threat: Limestone habitats are subject to mining more often than most other habitats

Action Category: Conserve specific land or seascapes

Specific Action: Preserve natural lands with strongly calcareous geology.

Objective: Prioritize unprotected calcareous lands and work with willing landowners to protect high priority sites.

Action Priority: **Action Urgency:** **Measure:** Acres protected by acquisition or easement

Potential Collaborators: Conservancies & Land Trusts

Locations: Statewide

Other species likely to benefit from this action: A broad range of snails, other invertebrates, vertebrates, and plants.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Maryland Glyph

Glyphyalinia raderi

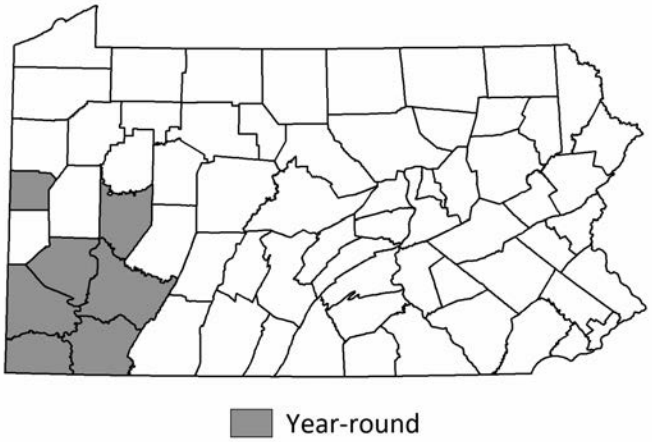
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



T. Pearce

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G2

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Limestone-rich forests with accumulations of rock or talus.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Low

Specific Threat: Limestone habitats are subject to mining more often than most other habitats

Action Category: Conserve specific land or seascapes

Specific Action: Preserve natural lands with strongly calcareous geology.

Objective: Prioritize unprotected calcareous lands and work with willing landowners to protect high priority sites.

Action Priority: **Action Urgency:** **Measure:** Acres protected by aquisition or easement

Potential Collaborators:

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus. Physiographic Section: Pittsburgh Low Plateau, Waynesburg Hills

Other species likely to benefit from this action: A broad range of snails, other invertebrates, vertebrates, and plants.

No known research needs.

Season: Year-round

Priority	Survey	Partners
3	Continue to survey for this species at limestone sites across southwestern Pennsylvania	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Cherrystone Drop

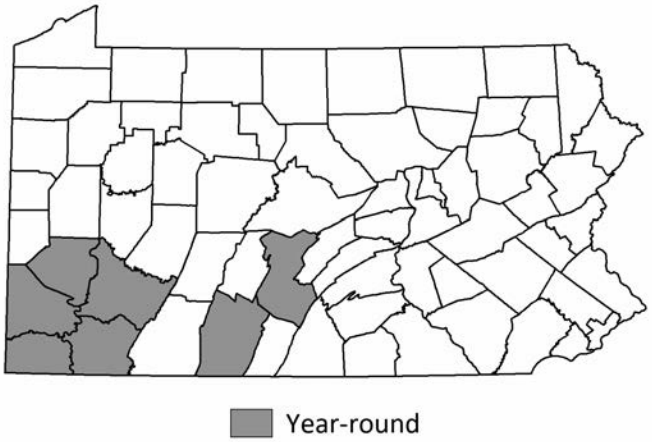
Hendersonia occulta

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and continue to search for additional populations.

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: High quality limestone forests on mountainsides, talus slopes, and ravines.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau, Allegheny Mountain

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Blue Glass

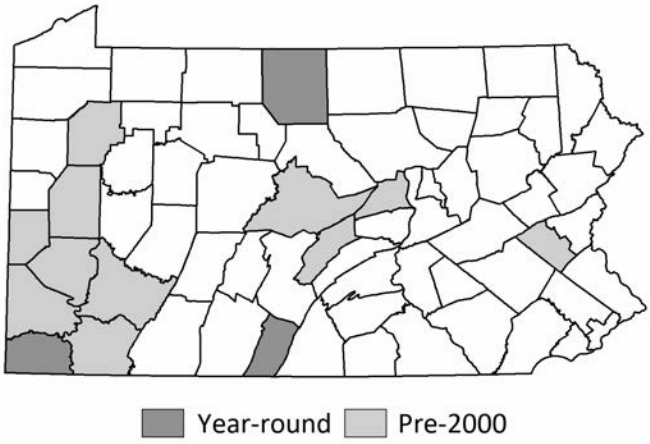
Nesovitrea binneyana

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forest.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Province: Appalachian Plateaus, Ridge and Valley

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Foster Mantleslug

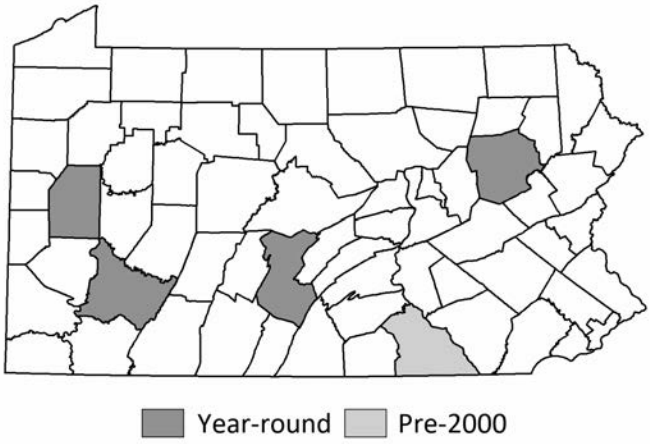
Pallifera fosteri

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Terrestrial habitats.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley. Physiographic Section: Pittsburgh Low Plateau, Allegheny Mountain

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Variable Mantleslug

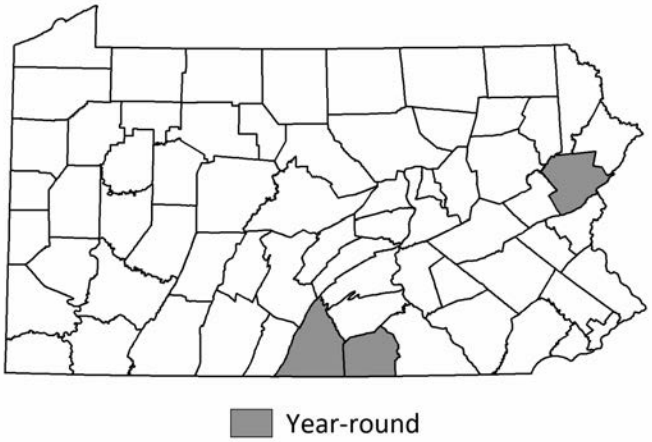
Pallifera varia

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the species' distribution.

NatureServe Global Rank: G2G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Upland hardwood forest, especially with lots of rotting wood and loose rock/talus.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying **Threat Impact:** High - Low

Specific Threat: Limestone habitats are subject to mining more often than most other habitats

Action Category: Conserve specific land or seascapes

Specific Action: Preserve natural lands with strongly calcareous geology.

Objective: Prioritize unprotected calcareous lands and work with willing landowners to protect high priority sites.

Action Priority: **Action Urgency:** **Measure:** Acres protected by acquisition or easement

Potential Collaborators:

Locations: Physiographic Province: Ridge and Valley, Appalachian Plateaus, Appalachian Plateaus. Physiographic Section: Appalachian Mountain, Glaciated Pocono Plateau, Glaciated Low Plateau

Other species likely to benefit from this action: A broad range of snails, other invertebrates, vertebrates, and plants.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Proud Globelet

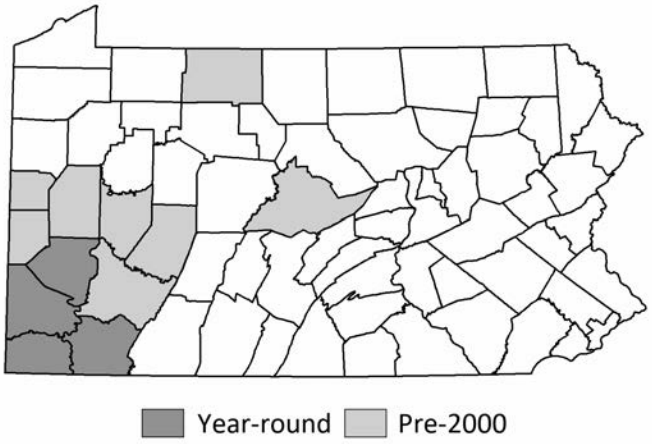
Patera pennsylvanica

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain current population levels through 2035, and improve our knowledge of the distribution and conservation needs of this species.

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Limestone forests, slopes and ravines, and grassy openings.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Widespread Column

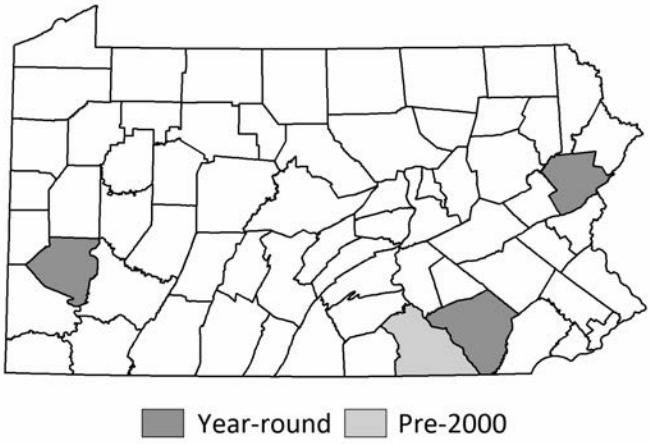
Pupilla muscorum

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and improve our knowledge of the species' distribution

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Terrestrial habitats.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying

Threat Impact: High - Low

Specific Threat: Limestone habitats are subject to mining more often than most other habitats

Action Category: Conserve specific land or seascapes

Specific Action: Preserve natural lands with strongly calcareous geology.

Objective: Prioritize unprotected calcareous lands and work with willing landowners to protect high priority sites.

Action Priority:

Action Urgency:

Measure: Acres protected by acquisition or easement

Potential Collaborators:

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Piedmont. Physiographic Section: Pittsburgh Low Plateau, Waynesburg Hills, Blue Mountain, Piedmont Lowland

Other species likely to benefit from this action: A broad range of snails, other invertebrates, vertebrates, and plants.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

White-lip Dagger

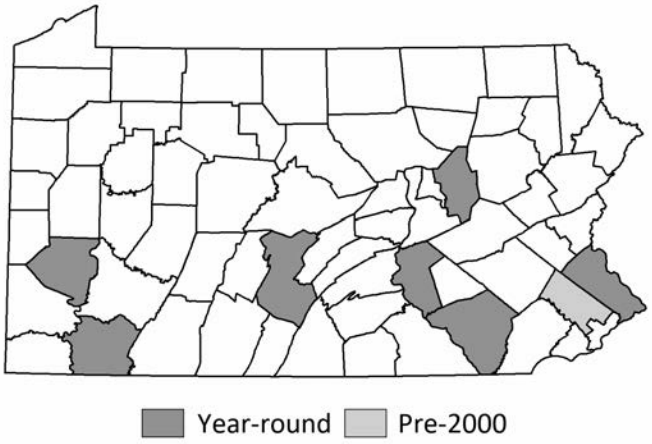
Pupoides nitidulus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Limestone-rich open areas.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Bristled Slitmouth

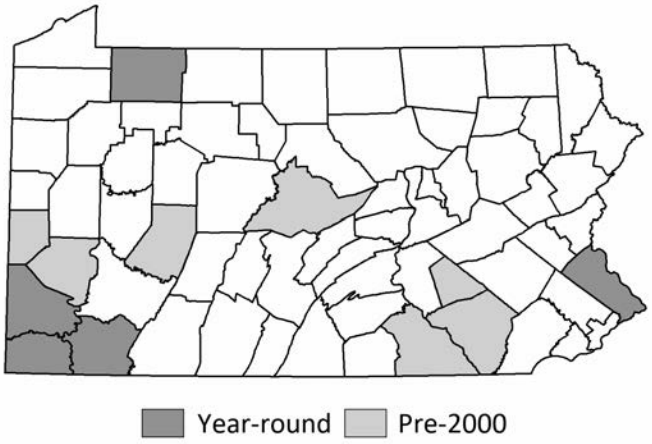
Stenotrema barbatum

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Upland forest.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Maze Pinecone

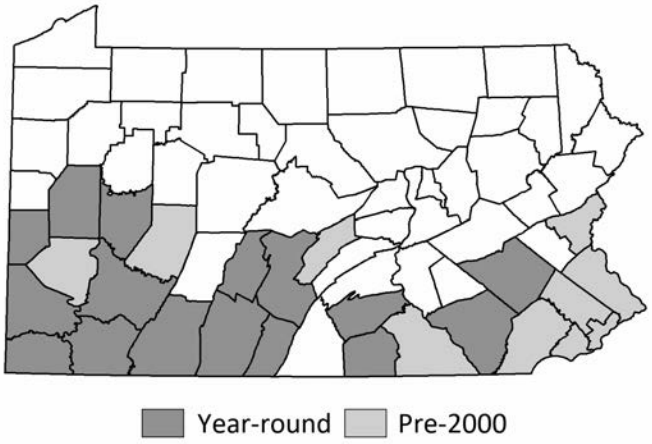
Strobilops labyrinthicus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Forest

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Province: Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Appalachian Plateaus, Ridge and Valley, Ridge and Valley, Ridge and Valley, Piedmont, Piedmont. Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau, Allegheny Mountain, Allegheny Front, Appalachian Mountain, Great Valley, Appalachian Mountain, Gettysburg-Newark Lowland, Piedmont Upland

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Southern Pinecone

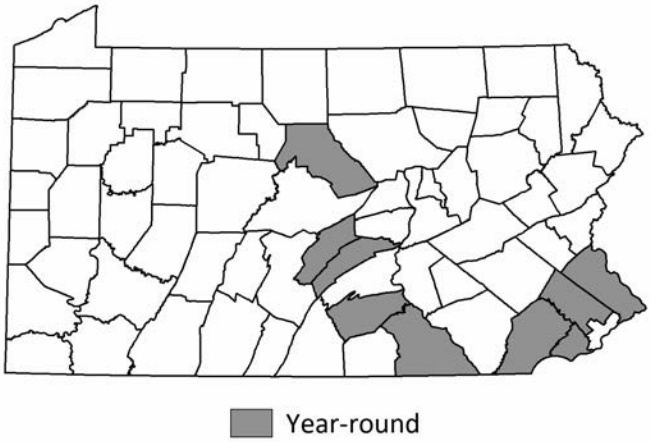
Strobilops texasianus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Unknown

Season: Year-round

Specific Habitat Requirements: Forest, especially with lots of leaf litter, steep slopes, and some moisture.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Province: Ridge and Valley, Piedmont, New England

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Baffled Three-tooth

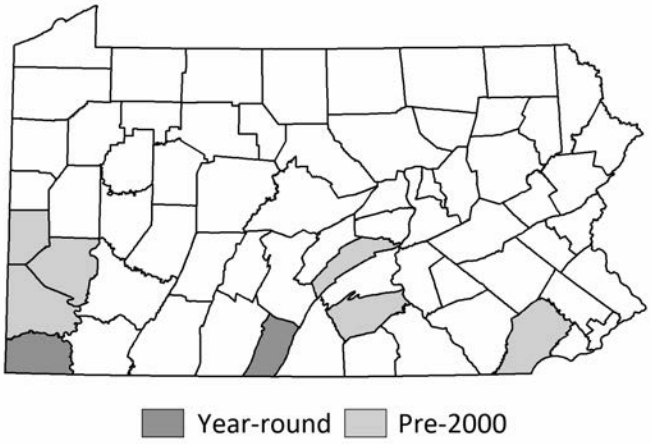
Triodopsis fraudulenta

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3?

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Both forested and open areas.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Province: Ridge and Valley, Piedmont. Physiographic Section: Waynesburg Hills, Appalachian Mountain, Piedmont Upland

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Atlantic Threetooth

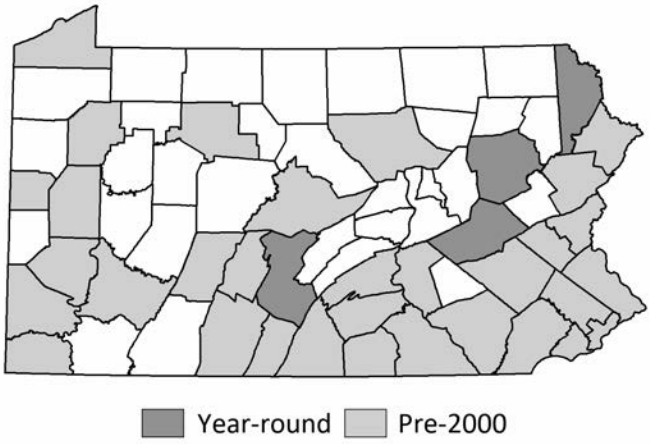
Triodopsis juxtidens

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Rich forests, and sometimes open areas.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Dished Threetooth

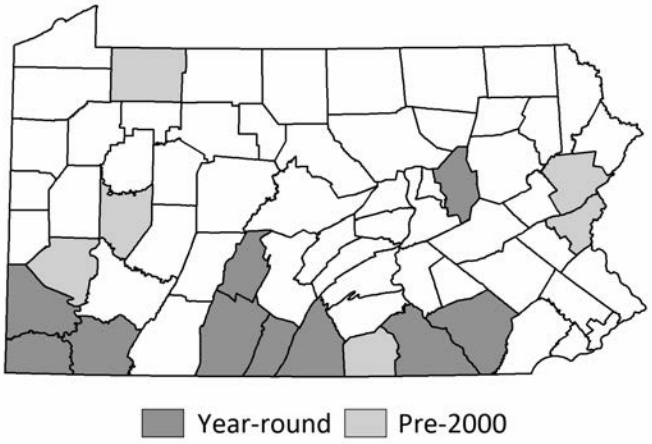
Triodopsis vulgata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Prefers mature or late-successional, mesic forests, inhabiting ravines and wooded hillsides (Hubricht, 1985)

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Physiographic Province: Piedmont, Piedmont, Ridge and Valley, Ridge and Valley. Physiographic Section: Waynesburg Hills, Pittsburgh Low Plateau, Appalachian Mountain, Anthracite Upland, Susquehanna Lowland, Gettysburg-Newark Lowland, South Mountain, Great Valley

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Split-tooth Dome

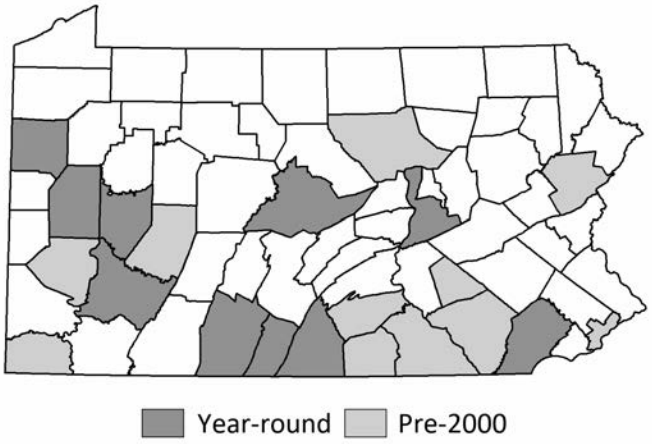
Ventridens virginicus

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035.

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Rocky, limestone, upland forest areas.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Blade Vertigo

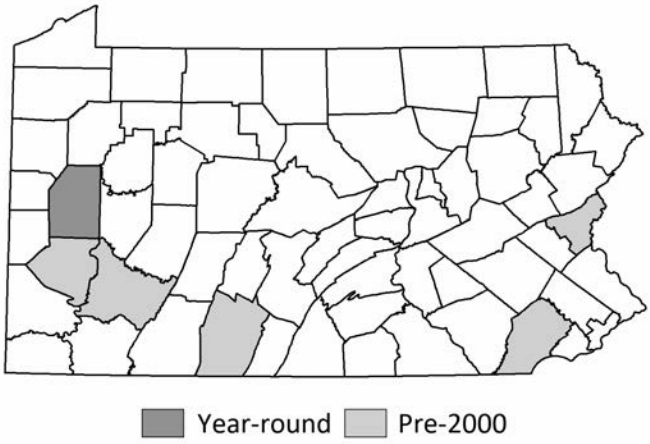
Vertigo milium

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations, and continue surveys for additional populations.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: A variety of habitats including forests, meadows, and wetlands.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ovate Vertigo

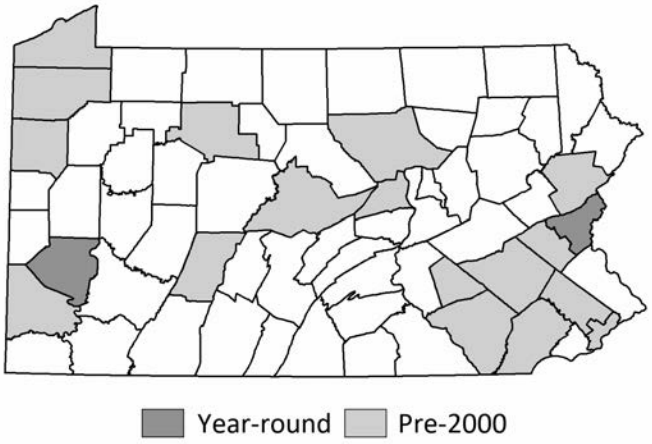
Vertigo ovata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Maintain known populations through 2035, and improve our knowledge of the species' distribution.

NatureServe Global Rank: G5

IUCN Red List Designation: Near Threatened

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S2S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open and shaded wetlands and riparian areas; occasionally upland forests and grasslands.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority:

Action Urgency:

Measure: Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

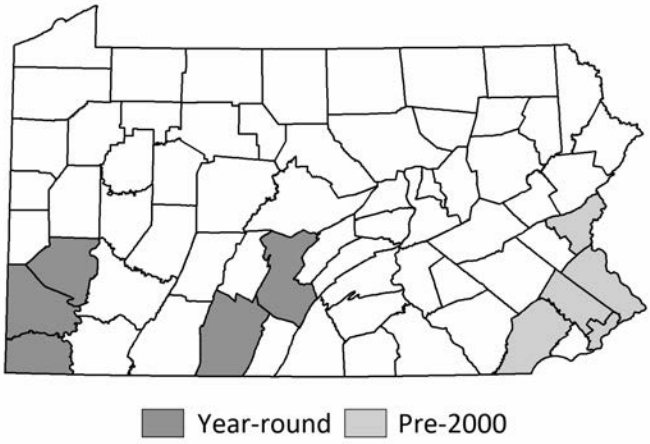
Pygmy Vertigo

Vertigo pygmaea

Pete Woods *Western Pennsylvania Conservancy*



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Grasslands, old fields, sedge meadows, and other open, often disturbed, areas..

Primary Habitat: Open Upland

Primary Habitat Type: Grasslands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Honey Vertigo

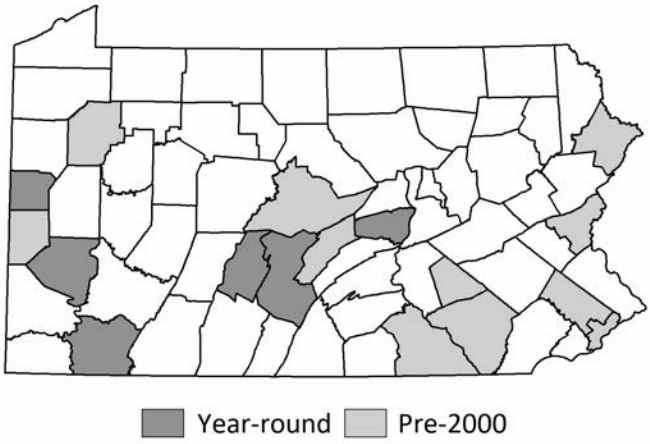
Vertigo tridentata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Limestone glades, shaded cliff ledges and talus, occasionally upland forest..

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Eastern Glass-snail

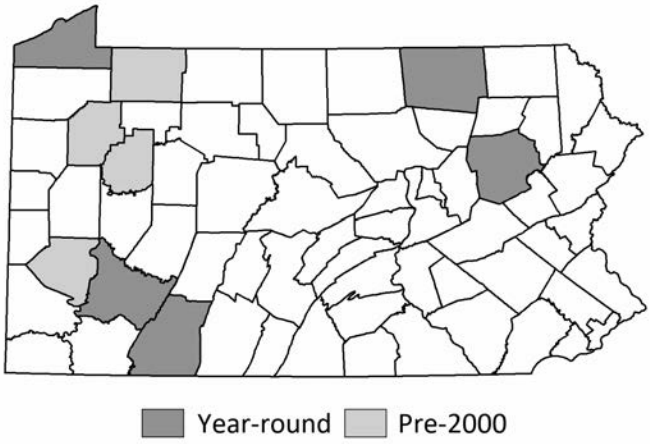
Vitrina angelicae

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal:

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forests, grasslands, and other open areas.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** High - Low

Specific Threat: Introduced earthworms, when they reach high densities, eliminate leaf litter that is the main habitat of forest snails. Introduced worms are spreading across PA, although the current status of the infestations is understudied.

Action Category: Outreach, communication and distribution

Specific Action: Minimize movement of soil and plant litter between sites, to prevent introduction of invasive earthworms to new sites.

Objective: Wash heavy equipment before it enters state land, and before it leaves state land.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Monitor presence/spread of invasive worms

Potential Collaborators:

Locations: Statewide

Other species likely to benefit from this action: forest-dwelling snails, other litter-dwelling invertebrates, forest salamanders, many wildflowers

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Striped Whitelip

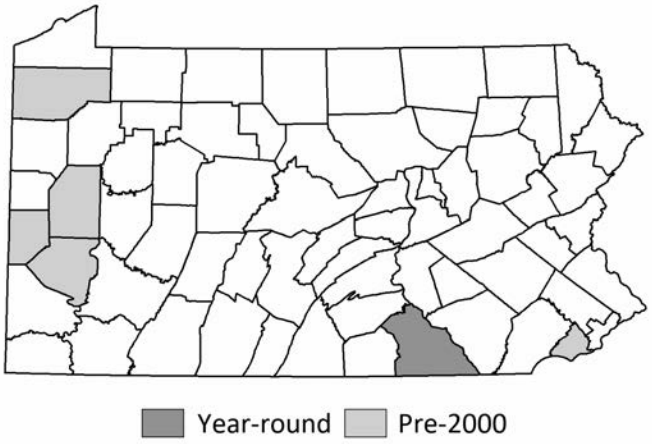
Webbhelix multilineata

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Confirm the recently discovered population, and determine the extent of the population.

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN: Very High Concern

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Wetlands, especially ones with skunk cabbage.

Primary Habitat: Palustrine

Primary Habitat Type: Non-Tidal Wetlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Dams and Water Management/Use **Threat Impact:** Low

Specific Threat: Lowering of groundwater levels, caused by withdrawals for residential/commercial/agricultural use, dry up seepage wetlands

Action Category: Conservation planning

Specific Action: Seepage sheds occupied by this species should be prioritized for conservation. Use watersheds as a proxy if seepage patterns are unknown. Minimize groundwater withdrawls and nutrient applications within these areas.

Objective: Incorporate the seepage sheds into conservation plans of municipalities, counties, and local land trusts.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5 years **Measure:** number of plans that incorporate conservation of these seepage sheds

Potential Collaborators: Conservancies & Land Trusts, Local agencies & municipalities, Private Landowners

Locations: Physiographic Province: Piedmont

Other species likely to benefit from this action: Seepage Dancer (Argia bipunctulata), Brown Spiketail (Cordulegaster bilineata), Tiger Spiketail (Cordulegaster erronea), River Bluet (Enallagma anna), Forcipate Emerald (Somatochlora forcipata), Brush-tipped Emerald (Somatochlora walshii), Gray Petaltail (Tachopteryx thoreyi)

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Heller Cave Springtail

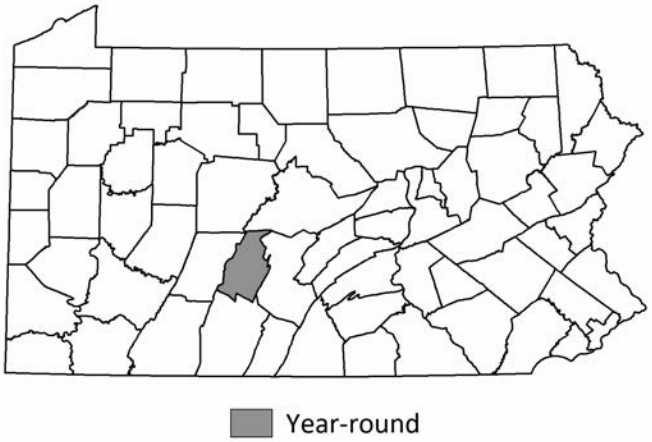
Typhlogastrura helleri

Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Secure permanent protection for the known population.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: Yes

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Very High

Season: Year-round

Specific Habitat Requirements: limestone caves

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Mining and Quarrying

Threat Impact: Very High

Specific Threat: The proposed mine at the type locality remains a looming, critical threat.

Action Category: Other legal actions

Specific Action: Continue to use environmental review to prevent this site from being mined.

Objective: Update the occurrence every 10 years at least.

Action Priority:

Action Urgency: Initiate immediately

Measure: How intact the cave remains

Potential Collaborators: U.S. Fish and Wildlife Service

Locations: Physiographic Province: Appalachian Plateaus, Ridge and Valley. Physiographic Section: Allegheny Front, Appalachian Mountain

Other species likely to benefit from this action: bats

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - Medium

Specific Threat: The loss of bats from WNS will result in complete loss or great reduction of guano deposits, which is one of the main habitats of Typhlogastrura species.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Spray polyethylene glycol (PEG)-8000 onto cave, mine, and tunnel surfaces to slow the spread of the white-nose syndrome fungus.

Objective: Reduce the spread of the WNS fungus to bats during the winter hibernation period.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: the population of bats in Heller Cave

Potential Collaborators: Pennsylvania Game Commission, Universities & research institutions

Locations: Physiographic Province: Appalachian Plateaus, Ridge and Valley. Physiographic Section: Allegheny Front, Appalachian Mountain

Other species likely to benefit from this action: Northern long-eared bats, Little brown bats, Tricolored bats, Big brown bats, and Indiana bats.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A ghost spider

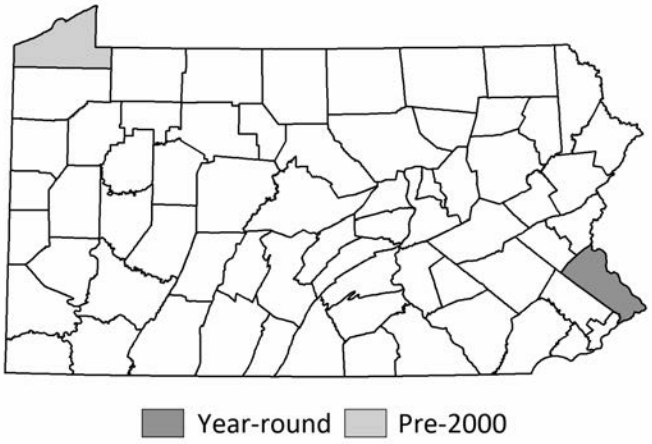
Arachosia cubana

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact:

Season: Year-round

Specific Habitat Requirements: Forests, wetlands, shores

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Problematic Native Species/Diseases **Threat Impact:** Medium

Specific Threat: succession of open habitats

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Manage invasive species and woody vegetation

Objective: Maintain open habitats

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Acres managed

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources, Universities & research institutions, Non-governmental organizations

Locations: HUC8 Watershed: Chautauqua-Conneaut

Other species likely to benefit from this action: Other spiders, insects, birds

Season: Year-round

Priority	Need	Partners
1	threats to habitats	

Season: Year-round

Priority	Survey	Partners
1	habitat and distribution surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Shoreline Wolf Spider

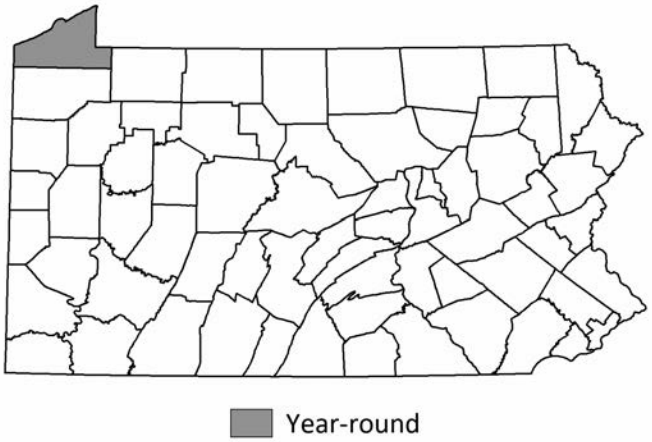
Arctosa littoralis

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G5

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Sandy beaches

Primary Habitat: Land-Water Interface

Primary Habitat Type: Beaches & Dunes

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Medium

Specific Threat: Invasive species in shore habitats

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Manage invasive species and woody vegetation

Objective: Maintain open beach habitat

Action Priority: 1-Highest **Action Urgency:** **Measure:** Acres managed

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Conservancies & Land Trusts, Non-governmental organizations

Locations: HUC8 Watershed: Chautauqua-Conneaut

Other species likely to benefit from this action: Other spiders, insects, birds

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Non-governmental organizations, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

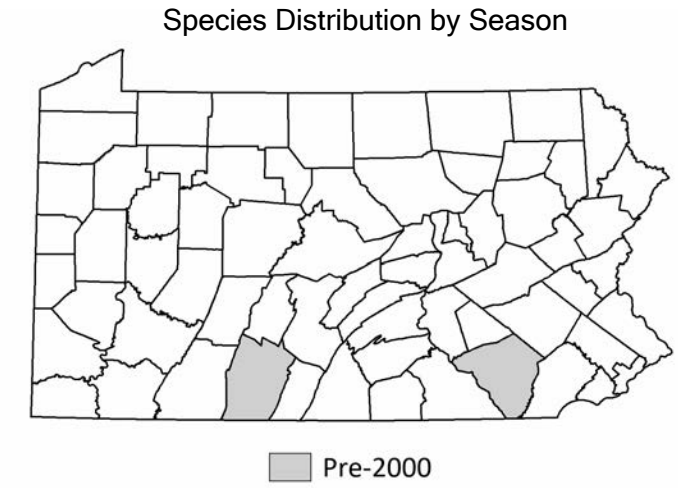
A sheetweb cave spider

Bathyphantes weyeri

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: G4

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium

Specific Threat: Concern about intensive agricultural practices

Action Category: Manage non-living habitat components

Specific Action: Maintain vegetated buffers for caves

Objective: Prevent the destruction of caves and maintain cave habitat

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of caves with buffers

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations

Locations: Physiographic Province: Appalachian Plateaus, Piedmont

Other species likely to benefit from this action: Other cave species

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Universities & research institutions, Non-governmental organizations

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Non-governmental organizations, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Turret Spider

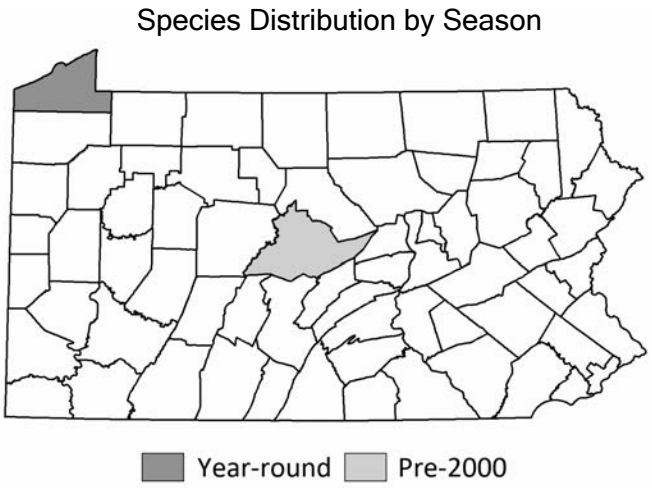
Geolycosa turricola

Mary Walsh, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



P. Briggs



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Open sand barrens with limited vegetation

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium

Specific Threat: Fire suppression, succession

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open up woodland and forest habitat to restore barrens habitats at Presque Isle and at Scotia Barrens. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Area restored and condition of land.

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission

Locations: Physiographic Section: Eastern Lake, Appalachian Mountain

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Non-governmental organizations, Universities & research institutions, Pennsylvania Department of Conservation and Natural Resources

Season: Year-round

Priority	Survey	Partners
3	Surveys to determine the distribution of the two species of burrowing wolf spiders at Presque Isle are needed. Surveys are needed to determine whether the Turret Spider is still present at Scotia Barrens.	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Wright's Burrowing Wolf Spider

Geolycosa wrighti

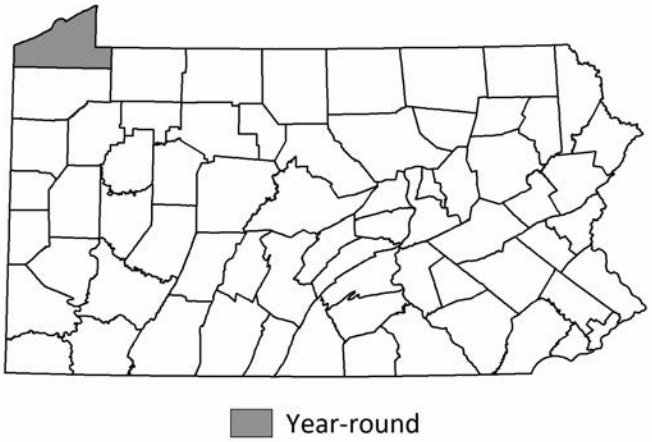
Mary Walsh, Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



L. Ramseyer

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Open very sandy soils with limited vegetation

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Great Lakes Wooded Dune and Swale

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium - Low

Specific Threat: Succession in beach habitats

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open up woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium **Action Urgency:** Initiate within 5-10 years **Measure:** Area restored and condition of land.

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Non-governmental organizations, Universities & research institutions, Pennsylvania Department of Conservation and Natural Resources

Season: Year-round

Priority	Survey	Partners
3	Surveys are needed to determine the distribution of both species of burrowing wolf spiders at Presque Isle	Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

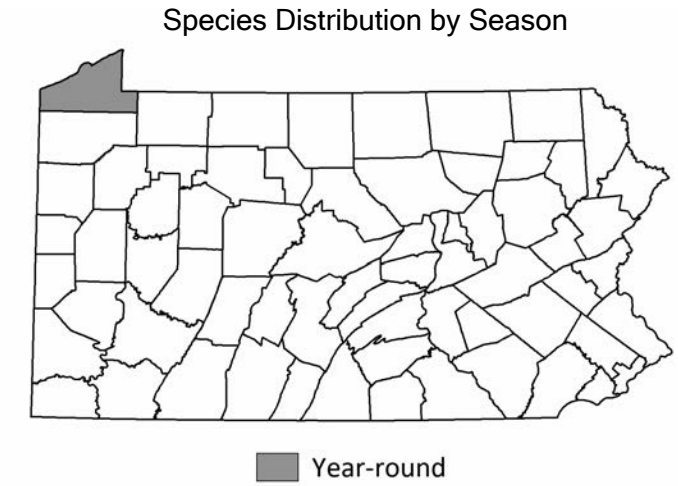
An Orb-weaver Spider

Singa eugeni

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Specific habitat requirements are currently not available.

Primary Habitat: Land-Water Interface

Primary Habitat Type: Beaches & Dunes

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases **Threat Impact:** Low

Specific Threat: Invasive species that alter habitats at Presque Isle

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Manage invasive species and woody vegetation

Objective: Maintain open habitats

Action Priority: 1-Highest **Action Urgency:** Initiate immediately **Measure:** Acres managed

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources

Locations: HUC8 Watershed: Chautauqua-Conneaut

Other species likely to benefit from this action: Other Presque Isle organisms

Season: Year-round

Priority	Need	Partners
1	threats to habitat	

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ash Bead Gall Mite

Aceria fraxini

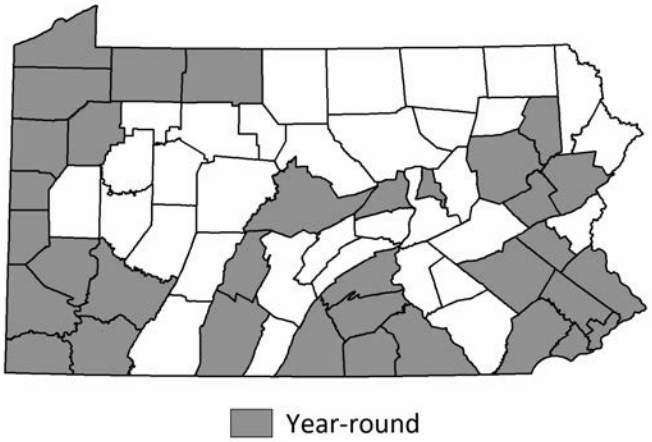
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Hallm

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species from Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Decline of 30-80%

Cumulative Threat Impact: Very High - Medium

Season: Year-round

Specific Habitat Requirements: On the foliage of ash (Fraxinus spp.) trees. Any forest with ash trees; upland or palustrine; not the northern acidic types.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. Aceria fraxini is still extant, persisting on ash saplings, but the ash seed bank is mostly gone now, and saplings will not be replaced as they mature to a size that can be attacked by EAB. The timeframe of sapling loss is uncertain; some may persist beyond the next 10 years. The ability of Aceria fraxinifolia to survive on insecticide-treated trees suggests that this species may also be able to do so, which could provide an important refuge.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Ash Flower Gall Mite

Aceria fraxiniflora

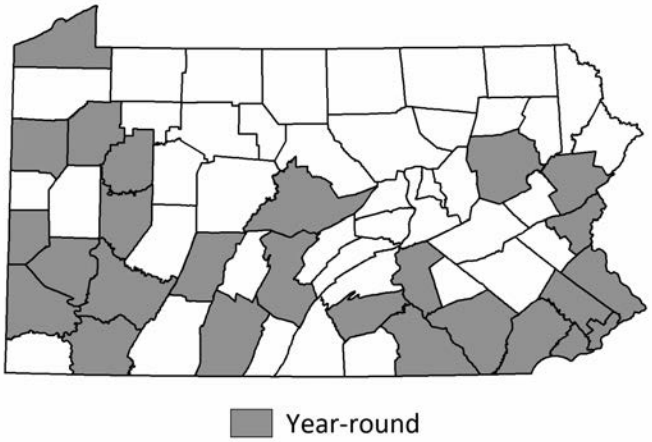
Pete Woods

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Wanderingeden

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Prevent the extirpation of the species from Pennsylvania.

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Low

SGCN Season: Year-round

State Rank (Season): S1

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: High - Medium

Season: Year-round

Specific Habitat Requirements: On flowers of ash trees (Fraxinus spp.). Any forest with ash trees; upland or palustrine; not the northern acidic types.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Invasive Non-native/Alien Species/Diseases

Threat Impact: Very High - High

Specific Threat: Emerald Ash Borer has killed virtually all mature ash trees in PA. Aceria fraxini requires mature, fruiting trees. Most remaining reproductive trees are being treated with insecticide, and there are observations of Aceria fraxiniflora growing on treated trees, although the identify of the insecticides was not determined (Joe Boggs, Ohio State Extension, personal communication). Therefore insecticide-treated ash trees may be the main refuge for this species, and loss of these trees through failure to maintain insecticide regimes may be the greatest ongoing threat to the mite.

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Promote the establishment of biological control agents for Emerald Ash Borer (Agrillus planipennis).

Objective: Release approved biocontrol agents at sites where Fraxinus spp. were previously abundant.

Action Priority: 2-High

Action Urgency: Initiate immediately

Measure: Number of sites where biocontrol agents are released. Number of sites where biocontrol agents have become established (detected 2 or more years after release).

Potential Collaborators: Pennsylvania Department of Conservation and Natural Resources, U.S. Department of Agriculture-Animal and Plant Health Inspection Service

Locations: Statewide

Other species likely to benefit from this action: At least 32 invertebrates that are highly dependent on Fraxinus spp., several species of fungi, and other invertebrates with lower dependency on ash trees.

No known research needs.

No known survey priorities.

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A jumping spider

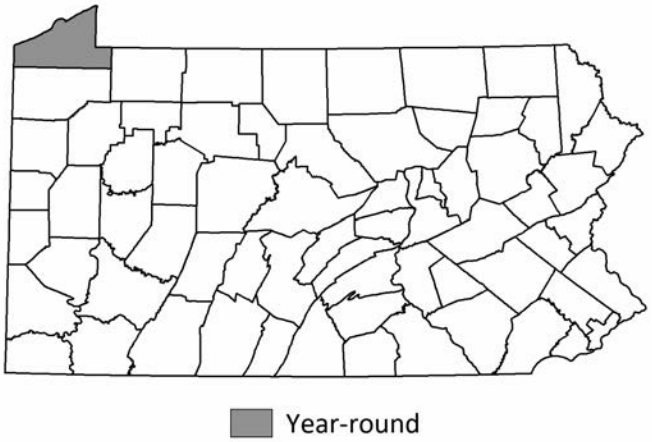
Habronattus cognatus

Mary Walsh ***Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program***



P. Woods

Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population: Medium

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Sandy coastal habitats

Primary Habitat: Land-Water Interface

Primary Habitat Type: Beaches & Dunes

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Medium

Specific Threat: Succession of open habitats

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Open up woodland and forest habitat to restore sand barrens in the interior dune area of Presque Isle. Suppress woody vegetation though some combination of cutting, herbicide, or burning.

Objective: Restore 20 hectares of sand barren habitat in the interior dune area of Presque Isle.

Action Priority: 3-Medium **Action Urgency:** **Measure:** Area restored and condition of land.

Potential Collaborators: Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission

Locations: Physiographic Province: Central Lowlands. Physiographic Section: Eastern Lake

Other species likely to benefit from this action: Turret Spider (Geolycosa turricola), Wright's Burrowing Wolf Spider (Geolycosa wrighti), two spider wasps (Anoplius apiculatus and Arachnospila sclelestus), Smooth Stag Beetle (Lucanus placidus)

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Universities & research institutions, Non-governmental organizations

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Common Leaf-beetle Jumping Spider

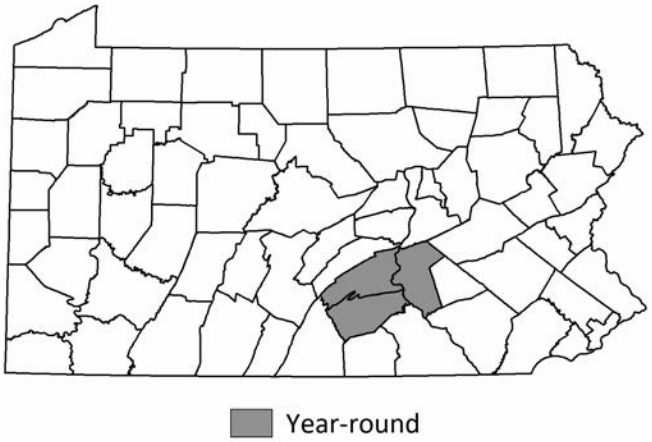
Sassacus papenhoei

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Open xeric habitats. The known Pennsylvania sites are on xeric rights-of-way on ridges, with dense brambles.

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Low

Specific Threat: Concern for urban development of open habitats

Action Category: Outreach, communication and distribution

Specific Action: Encourage parks, schools, and communities to have native vegetation and a diversity of habitats within urban areas (similar to pollinator habitat recommendations)

Objective: Manage for diverse landscapes, with natural habitats for invertebrates in developed areas

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of outreach events

Potential Collaborators: Pennsylvania Association of Conservation Districts, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations

Locations: Physiographic Province: Ridge and Valley

Other species likely to benefit from this action: Other invertebrates

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Universities & research institutions, Non-governmental organizations

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Non-governmental organizations, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

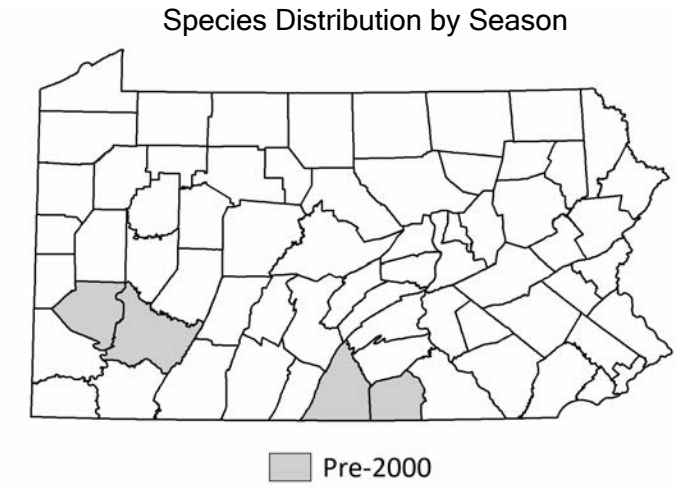
Robust Trapdoor Spider

Antrodiaetus robustus

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program





Conservation Profile

PA 10-Year Conservation Goal: Conserving Antrodiaetus robustus is important for conservation of a spider wasp (Calopompilus spp.).

NatureServe Global Rank: G3?

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Forests, often on slopes where leaves cannot accumulate

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Annual and Perennial Non-timber Crops **Threat Impact:** Medium

Specific Threat: Intensive agricultural practices

Action Category: Outreach, communication and distribution

Specific Action: Encourage low impact agriculture practices and farmer to enroll in conservation programs

Objective: Maintain diverse landscapes on farms

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of outreach activities implemented

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Association of Conservation Districts, U.S. Department of Agriculture-Natural Resources Conservation Service

Locations: Statewide

Other species likely to benefit from this action: Insects and birds

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Non-governmental organizations, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

A foldingdoor spider

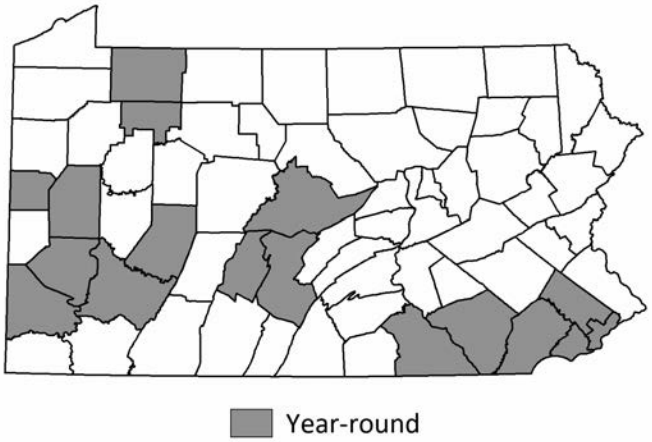
Antrodiaetus unicolor

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S3S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Forests, often on slopes where leaves cannot accumulate

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium - Low

Specific Threat: Expansion of urbanization and destruction of forested habitats.

Action Category: Outreach, communication and distribution

Specific Action: Encourage parks, schools, and communities to have native vegetation and a diversity of habitats within urban areas (similar to pollinator habitat recommendations)

Objective: Ensure diverse landscapes, with natural habitats for invertebrates, occur in developed areas

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Number of outreach events

Potential Collaborators: Conservancies & Land Trusts, Non-governmental organizations, Pennsylvania Department of Conservation and Natural Resources

Locations: Statewide

Other species likely to benefit from this action: Other spiders and invertebrates

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Non-governmental organizations, Universities & research institutions, Pennsylvania Department of Conservation and Natural Resources

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Non-governmental organizations, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

Texas Ornamented Jumping Spider

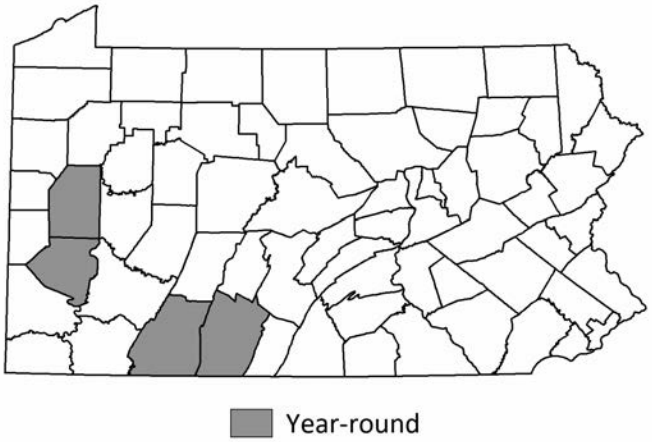
Habronattus texanus

Mary Walsh

Western Pennsylvania Conservancy, Pennsylvania Natural Heritage Program



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S2S4

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Suburban parks

Primary Habitat: Forested Upland

Primary Habitat Type: Forests & Woodlands

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium

Specific Threat: Suburban/urban development

Action Category: Outreach, communication and distribution

Specific Action: Encourage parks, schools, and communities to have native vegetation and a diversity of habitats within urban areas (similar to pollinator habitat recommendations)

Objective: Manage for diverse landscapes, with natural habitats for invertebrates in developed areas

Action Priority: **Action Urgency:** Initiate within 5 years **Measure:** Number of outreach events

Potential Collaborators: Pennsylvania Association of Conservation Districts, Conservancies & Land Trusts, Local agencies & municipalities, Non-governmental organizations

Locations: Physiographic Province: Appalachian Plateaus

Other species likely to benefit from this action: Other invertebrates, birds

Season: Year-round

Priority	Need	Partners
1	Threats to habitat and species	Non-governmental organizations, Universities & research institutions

Season: Year-round

Priority	Survey	Partners
1	Distribution and habitat studies	Non-governmental organizations, Universities & research institutions

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

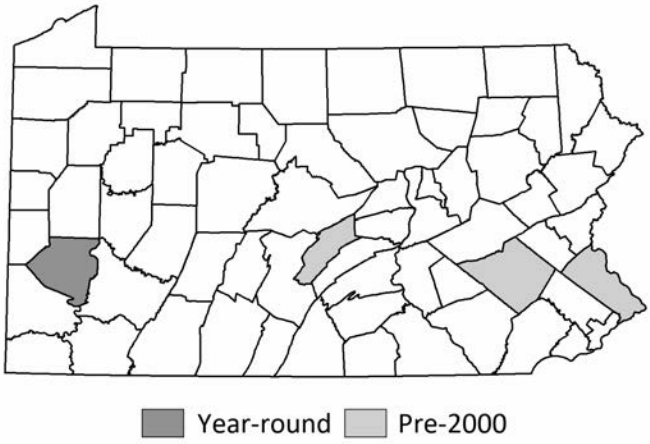
Pale Nest Spider

Eidmannella pallida

Mary Walsh — *Western Pennsylvania Conservancy*



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S3

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Medium

Season: Year-round

Specific Habitat Requirements: Caves and other subsurface habitats

Primary Habitat: Subterranean

Primary Habitat Type: Caves & Karst

Primary Specific Habitat: Unknown

Season: Year-round

Threat Category: Housing and Urban Areas **Threat Impact:** Medium

Specific Threat: Concern about intense agricultural practices in some ag habitats near caves. Destruction of caves.

Action Category: Outreach, communication and distribution

Specific Action: Communicate with landowners regarding cave conservation

Objective: Improve localized land use best practices to cave conservation

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Effective communication of best management practices through successful interaction.

Potential Collaborators: Conservancies & Land Trusts

Locations: Physiographic Province: Ridge and Valley, Piedmont

Other species likely to benefit from this action: Other cave taxa

Season: Year-round

Priority	Need	Partners
1	threats to habitat	

Season: Year-round

Priority	Survey	Partners
1	distributions and habitat surveys	

No known monitoring programs.

No references identified.

PENNSYLVANIA WILDLIFE ACTION PLAN

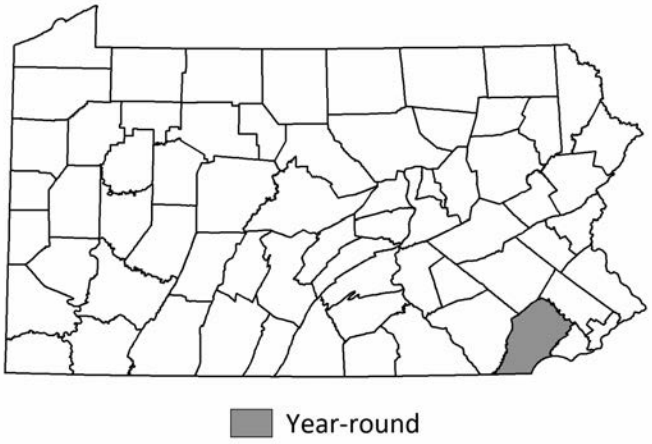
Audouin's Trapdoor Spider

Ummidia audouini

Mary Walsh — *Western Pennsylvania Conservancy*



Species Distribution by Season



Conservation Profile

PA 10-Year Conservation Goal: Assess distribution, population trends, and habitat needs and maintain the current populations over 10 years

NatureServe Global Rank: GNR

IUCN Red List Designation: Not Evaluated

IUCN Red List Trend:

Identified Conservation Priority by Established Groups: No

Northeast U.S.RSGCN:

Federal Listing Status: Not Listed

Feasiblity of Recovering or Sustaining the PA Population:

SGCN Season: Year-round

State Rank (Season): S1S2

State Rank Year: 2024

PA Legal Designation: Not Listed

PA Abundance: Unknown

PA Short-term Trend (10-year): Unknown

Cumulative Threat Impact: Low

Season: Year-round

Specific Habitat Requirements: Forested slopes with clay soils. The single known Pennsylvania site is in a serpentine barren.

Primary Habitat: Open Upland

Primary Habitat Type: Glades, Barrens & Savannas

Primary Specific Habitat: Serpentine Barren / Woodland

Season: Year-round

Threat Category: Fire and Fire Suppression **Threat Impact:** Low

Specific Threat: Fire suppression/succession in barrens habitat

Action Category: Manage plants, animals, fungi, or bacteria

Specific Action: Maintain open barrens habitats through vegetation management.

Objective: Selectively remove woody vegetation and supress invasive species

Action Priority: 1-Highest **Action Urgency:** Initiate within 5 years **Measure:** Acres of open barrens habitat managed

Potential Collaborators: Conservancies & Land Trusts, Pennsylvania Department of Conservation and Natural Resources

Locations: Physiographic Province: Piedmont

Other species likely to benefit from this action: Other invertebrates that inhabit barrens

Season: Year-round

Priority	Need	Partners
1	threats to habitat	

Season: Year-round

Priority	Survey	Partners
1	distribution and habitat surveys	

No known monitoring programs.

No references identified.