



Implementation Case Studies

CHAPTER 9

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Northeast Motus Collaboration: Tracking Birds, Bats, and Bugs across Pennsylvania

Scott Weidensaul¹, Lucas W. DeGroot¹, Alison Fetterman¹ and Sean Murphy²

¹Northeast Motus Collaborative and ²Pennsylvania Game Commission



photo credit: A. Fetterman

Project Location: Statewide, as well as throughout New England and the mid-Atlantic Region

Species of Greatest Conservation Need/Priority Habitat Affected

The Motus Wildlife Tracking System (Motus; motus.org), a network of automated radio telemetry stations, enables scientists to track small-bodied animals to better understand the biology of migratory birds, bats, and insects like monarch butterflies. Since 2017, the network of 73 Motus receiver stations throughout Pennsylvania has detected more than 1,200 individuals of more than 130 species of migratory birds, bats and insects carrying nanotag or similar transmitters. These include 38 bird Pennsylvania Species of Greatest Conservation Need (SGCN) such as Common Nighthawk, Eastern Whip-poor-will, Rusty Blackbird [2015-25 SGCN], Grasshopper Sparrow, and Cerulean Warbler, as well as three SGCN bat species: Silver-haired, Indiana, and Little Brown. The network has also facilitated large-scale, single-species research on such SGCN birds as Wood Thrush, Canada Warbler, American Woodcock [2015-25 SGCN], Eastern Towhee [2015-25 SGCN], Bobolink, and tracking movements of Indiana bats from maternity colonies to hibernacula.

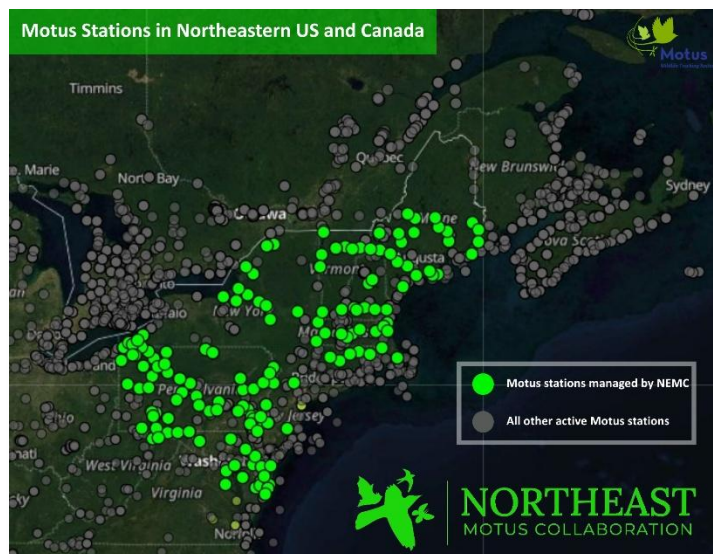
Project Purpose

Build a statewide Motus receiver array and expand to a regional network, enabling the tracking and management of migratory animals across multiple scales—from individual habitats to entire landscapes. Motus enables conservation by filling critical knowledge gaps and informing management decisions for many species.

Project Description

The Northeast Motus Collaboration (NEMC; northeastmotus.com), based at the Willistown Conservation Trust, was founded in 2016 in partnership with the Pennsylvania Game Commission; Ned Smith Center for Nature and Art; Project OwlNet; and the Carnegie Museum of Natural History's Powdermill Nature Reserve. As the first large regional Motus network outside of Canada, the NEMC began installing receivers in 2017, and as of 2025, now manages more than 144 Motus receiver stations across 12 states, more than a third of which are in Pennsylvania.

The Pennsylvania Motus array provides an unprecedented ability to track small (<50g) migratory animals across broad spatial scales, providing critical conservation information about migration routes and timing. The network also facilitates research on pre- and post-breeding movements, juvenile dispersal and mortality. The detection data provided by the Motus system are not replicable by other means, given the small size of most of the species being tagged and tracked, the distances across which they travel, and the challenges to their detection in the case of nocturnal or long-distance migrants.



The Pennsylvania Motus array has met a variety of goals laid out in the 2015 Pennsylvania Wildlife Action Plan, including providing receiver infrastructure for the first range-wide (breeding and non-breeding) tracking effort for Wood Thrush, a species for which 8% of the global population breeds in Pennsylvania); an eastern continental effort to study the migratory connectivity of Northern Saw-whet Owls; documenting movements and migratory stopover areas for Rusty Blackbirds (2015-25 SGCN); and an assessment of risk from potential offshore wind development in Lake Erie to migrating passerines.

Project Partners

The power of the Motus Wildlife Tracking System lies in collaboration. With more than 2,000 partners worldwide, every additional receiving station on the landscape improves detections for all partners tracking animals. Contributing partners to the Northeast Motus Collaboration network include Pennsylvania Game Commission, U.S. Fish and Wildlife Service, Birds Canada, Willistown Conservation Trust, Powdermill Nature Reserve, Carnegie Museum of Natural History, Project OwlNet, Ned Smith Center for Nature and Art, American Bird Conservancy, and New Hampshire Audubon.

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Motus Wildlife Tracking receiver on State Game Lands 143.
Photo credit: NEMC



Charting Change: Pennsylvania's Third Bird Atlas Project

Sean Murphy

State Ornithologist, Pennsylvania Game Commission

Project Location: Statewide

Species of Greatest Conservation Need/Priority Habitat Affected

All Species of Greatest Conservation Need and birds present in Pennsylvania throughout the year.



Photo credit: E. Crisfield

Project Purpose

Pennsylvania's Third Bird Atlas (2024–2029) is an ambitious project harnessing the power of volunteers to provide a comprehensive update on bird populations and distributions. For the first time, it includes *both breeding and winter seasons*. Its statewide scope makes it an essential tool for setting bird conservation priorities across Pennsylvania.

Project Description

Pennsylvania's Third Bird Atlas (PBA3) builds on the success of the first two statewide atlas efforts (1983–1989 and 2004–2009) through a coordinated network of thousands of volunteer birders, county coordinators, and regional leaders. Using eBird-based data collection, participants are documenting breeding and winter bird distributions across Pennsylvania's 4,938 atlas blocks, each approximately 9 square miles in size. For the first time, the Atlas includes a comprehensive winter survey, providing year-round information on bird occurrence and relative abundance.

In addition to volunteer observations, PBA3 incorporates standardized point-count surveys to estimate the relative abundance of bird species. A point count is a survey conducted by an observer at a fixed location for a specified time, during which all detected birds are recorded. As in the Second Pennsylvania Bird Atlas, trained survey crews will conduct point counts throughout the Atlas period. A key advancement of PBA3 is the inclusion of volunteer-conducted point counts. Under this approach, a subset of experienced Atlas participants will complete four standardized point counts within each atlas block over the course of the project.



Photo credit: J. Kosack, PGC

Together, volunteer observations, breeding evidence, winter records, and point-count data will be used to develop detailed distribution maps, estimate species abundance, and assess changes in bird populations since previous atlas periods. The resulting information will help guide conservation priorities, habitat management, land-use planning, and wildlife policies, shaping bird conservation efforts across Pennsylvania for decades to come.

Project Partners

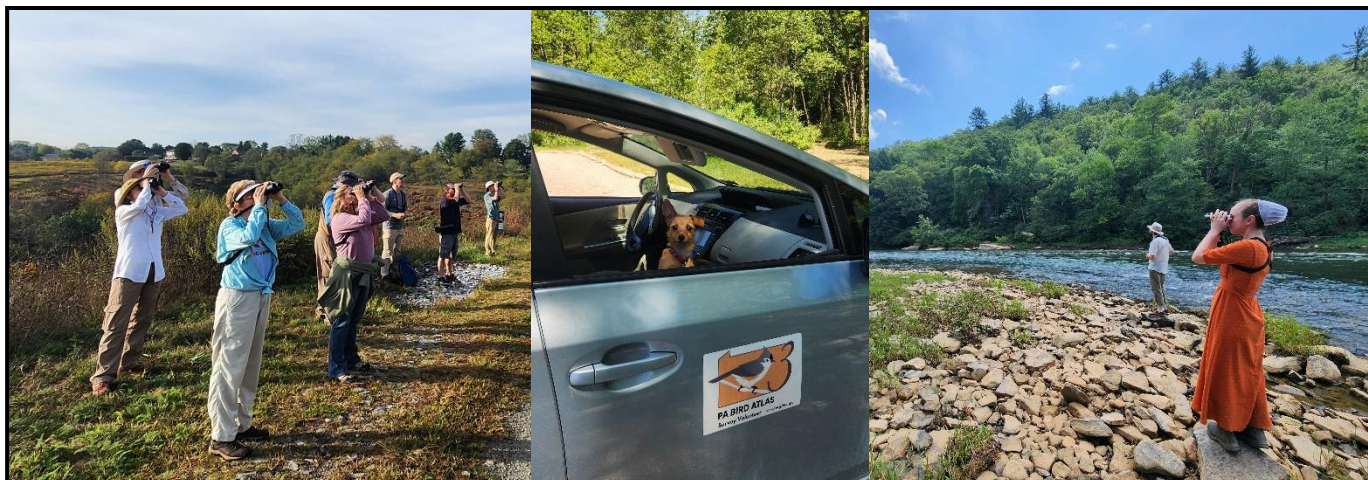
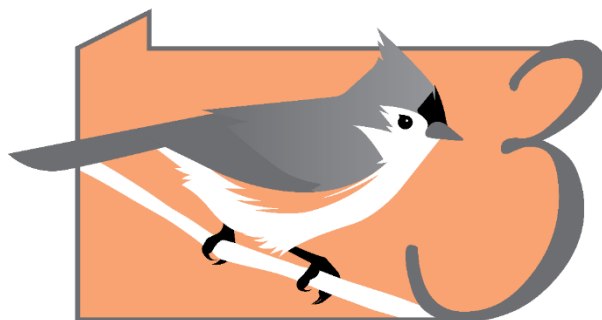
The PBA3 is a collaborative project led by the Pennsylvania Game Commission (PGC) and Hawk Mountain Sanctuary. Major funding is provided by PGC, while Hawk Mountain Sanctuary contributes critical institutional support. Additional in-kind and financial support is provided by the Cornell Lab of Ornithology, the Pennsylvania Society for Ornithology, and the Pennsylvania Audubon Council. Most importantly, the success of PBA3 depends on the dedication of hundreds of volunteers whose countless hours of field surveys, data collection, and coordination form the foundation of this statewide effort.

References

3rd Pennsylvania Bird Atlas: <https://www.pa.gov/agencies/pgc/wildlife/wildlife-viewing/birding/pa-bird-atlas>.

Data portal for the Pennsylvania Bird Atlas: <https://ebird.org/atlaspa/home>.

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Conservation Success: Raptor Recovery in Pennsylvania

Sean Murphy

State Ornithologist, Pennsylvania Game Commission

Photo credit: A. Wiewel



Photo credit: PGC

Project Location: Statewide

Species of Greatest Conservation Need/Priority Habitat Affected

Bald Eagle (*Haliaeetus leucocephalus*), Osprey (*Pandion haliaetus*), and Peregrine Falcon (*Falco peregrinus*)

Project Purpose

Restore Pennsylvania populations of Bald Eagles, Ospreys, and Peregrine Falcons following severe declines caused by pesticide (DDT) contamination, habitat loss, and human disturbance through species reintroductions, nest-site management, habitat protection, and long-term monitoring consistent with Pennsylvania Wildlife Action Plan conservation objectives.

Project Description

During the mid-20th century, populations of Bald Eagles, Ospreys, and Peregrine Falcons declined dramatically throughout Pennsylvania due primarily to pesticide (i.e., DDT) contamination which caused eggshell thinning and reproductive failure. Habitat loss, human disturbance, and direct persecution further contributed to population declines. By the 1970s, Peregrine Falcons had been extirpated as breeding birds in Pennsylvania, while Bald Eagles and Ospreys persisted at low levels.

Following a federal ban on DDT and increased environmental protections, state and federal agencies initiated coordinated recovery efforts. Bald Eagle restoration included translocation and release of nestlings from healthier populations, protection of nesting territories, and long-term monitoring. Osprey recovery efforts focused on installation of artificial nesting platforms near reservoirs, lakes, and

wetlands to increase nesting opportunities and reproductive success. Peregrine Falcon restoration relied on captive-breeding and hacking programs that released young falcons into suitable habitats, including urban environments where bridges and tall buildings served as surrogate cliff nesting sites.

These efforts resulted in one of Pennsylvania's most successful wildlife recoveries – all three species have been identified as recovered and removed from the state threatened and endangered species list (Bald Eagle - 2014; Osprey - 2017; Peregrine Falcon - 2021). Bald Eagles now nest throughout much of the Commonwealth, Ospreys occupy rivers, lakes, and reservoirs statewide, and Peregrine Falcons have re-established breeding populations on natural cliffs and artificial structures. These recovery programs demonstrate the effectiveness of science-based management, habitat protection, population monitoring, and a long-term commitment of resources.

While the Bald Eagle Osprey are no longer a Species of Greatest Conservation Need (SGCN), the Peregrine Falcon continues as SGCN in 2025. The recovery of these raptors directly supports Pennsylvania Wildlife Action Plan goals by restoring native wildlife populations and protecting critical habitats. The project also serves as a model for collaborative conservation efforts supported through state, federal, and partner programs.

Project Partners

Pennsylvania Game Commission, U.S. Fish and Wildlife Service, Pennsylvania Department of Conservation and Natural Resources, The Peregrine Fund, National Audubon Society Pennsylvania Department of Transportation; utility and communication companies and building owners/managers providing nesting structures and site access; local conservation organizations and volunteers.

References

Bald Eagle

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Osprey

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Murphy, S.P. 2022. Osprey Research/Management and Surveys. Bureau of Wildlife Management Annual Report. Pennsylvania Game Commission, Harrisburg, Pennsylvania.

Peregrine Falcon

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Clarion and Kiskiminetas Rivers Restoration and Conservation

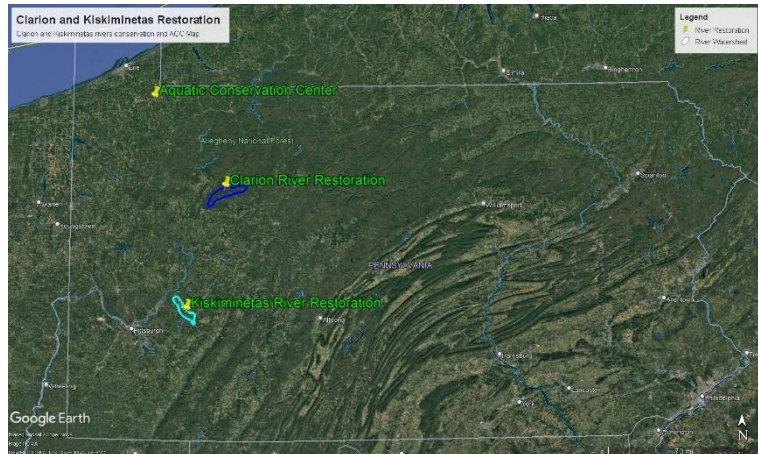
Scott Ray

Pennsylvania Fish and Boat Commission

Project Location: Western Pennsylvania; Ohio Watershed-Clarion River, Kiskiminetas River; Clarion-Clear Creek State Park to Mill Creek, Kiski River-Saltsburg to Leechburg

Species of Greatest Conservation Need/Priority Habitat Affected

Wavyrayed Lampmussel (*Lampsilis fasciola*), Rainbow (*Cambarunio iris*), Pocketbook (*Lampsilis ovata*)



Project Purpose

The Pennsylvania Fish and Boat Commission (PFBC) Union City Aquatic Conservation Center (ACC) is working to help restore mussel populations in the Clarion and Kiskiminetas Rivers. This project implements the PFBC Strategic Plan, Pennsylvania Wildlife Action Plan and Pennsylvania Freshwater Mussel Conservation Plan for four mussel Species of Greatest Conservation Need (SGCN).

Project Description

Pennsylvania rivers with mussel populations that were historically destroyed by pollution, urbanization, or industrialization, but are experiencing recovery and are targets for mussel restoration. The Clarion and Kiskiminetas River mussels were largely destroyed by poor water quality associated with unregulated deforestation, mining and industrialization. Since the Clean Water Act there has been great water quality improvements increasing the odds for successful mussel and fish restoration. Both rivers flow into the Allegheny River – a river with a lot mussel species – which may contribute to restoration of the lower Clarion and Kiski. Our efforts are designed to jumpstart the species restoration work with careful studies and stockings of each river. Our mussel restoration work coincides with Clarion River darter species reintroductions creating a healthier river ecosystem for both taxa groups. Creating and fostering a healthy riverine fish and mussel ecosystem will contribute to cleaner water, better recreation, and increase species stability by creating greater population redundancy that helps protect future generations of mussels. The PFBC Strategic Plan calls for continued propagation of nongame animals for conservation and restoration. The Pennsylvania Wildlife Action Plans also calls for mussel conservation and restoration which allows additional focus on mussel conservation. PFBC mussel conservation is supported by USFWS State Wildlife Grants and other funding sources.

Project Partners

National Fish and Wildlife Foundation; U.S. Fish and Wildlife Service; Pennsylvania Department of Environment Protection; Western Pennsylvania Conservancy; Penn West Clarion University

References

Western Pennsylvania Conservancy and Pennsylvania Fish and Boat Commission. 2025. Pennsylvania Freshwater Mussel Conservation Plan. Support from National Fish and Wildlife Foundation.

<https://waterlandlife.org/watershed-conservation/freshwater-mussel-conservation-plan/>

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Dunkard Creek Mussel Restoration and Conservation

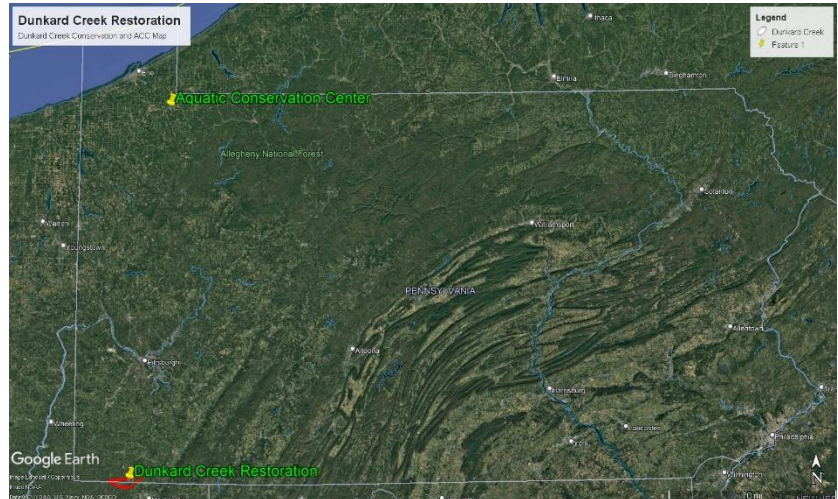
Scott Ray

Pennsylvania Fish and Boat Commission

Project Location: Western Pennsylvania; Ohio River Watershed, Monongahela River, Dunkard Creek; Dunkard-Mt. Morris, Pennsylvania

Species of Greatest Conservation Need/Priority Habitat Affected

Wavyrayed Lampmussel, Pistolgrip (*Quadrula verrucosa*), Salamander Mussel (*Simpsonaias ambigua*), Threeridge (*Amblema plicata*), Cylindrical Papershell (*Anodontoides ferussacianus*), Wabash Pigtoe (*Fusconaia flava*), Fragile Papershell (*Potamilus fragilis*), Snuffbox (*Epioblasma triquetra*), Clubshell (*Pleurobema clava*), Round Pigtoe (*Pleurobema sintoxia*)



Project Purpose

The Pennsylvania Fish and Boat Commission (PFBC) Union City Aquatic Conservation Center (ACC) is working to help restore mussel populations in Dunkard Creek following a catastrophic fish and mussel kill in 2009. This project follows the PFBC Strategic Plan, State Wildlife Action Plan and Pennsylvania Freshwater Mussel Conservation Plan for three mussel Species of Greatest Conservation Need (SGCN).

Project Description



Individually tagged, and Passive Integrated Transponder (PIT) tagged Pistolgrip mussels in a mesh bag, that were stocked into Dunkard Creek in 2022. Photo credit: J. Howard, PFBC

Dunkard Creek's water quality was severely degraded by a 2009 pollution event. Water quality has since improved and Dunkard Creek is slowly recovering. Prior to 2009, Dunkard Creek was considered the crown jewel of the Monongahela River basin and the most species diverse mussel stream with 22 species, including 10 SGCN or state and federally listed species such as the Snuffbox, Pistolgrip, and Salamander Mussel. Both the State Wildlife Action Plan and the PFBC Strategic Plan call for mussel conservation including propagation of nongame animals for conservation and restoration and Dunkard Creek is a

PFBC restoration priority. The ACC is propagating mussels for reintroduction into areas of Dunkard Creek to recover the lost mussel populations and to aid in the continued statewide conservation of many SGCN or listed species. To conserve Pennsylvania's population of Pistolgrip mussels, we need to restore or augment existing populations to create redundancy to prevent another pollution event from destroying remaining populations. The Salamander Mussel is another Dunkard Creek mussel that the ACC is developing propagation protocols to support restoration priorities outlined in PFBC's Species Action plan. These mussel propagation and restoration activities will help the ACC develop new techniques that will benefit other SGCN species. As water quality and habitats continue to improve in Dunkard Creek, additional SGCN species restoration will continue via translocation or propagation. The ACC's work has been supported by USFWS State Wildlife Grants and other funding sources.

Project Partners

Pennsylvania Department of Environment Protection

References

Western Pennsylvania Conservancy and Pennsylvania Fish and Boat Commission. 2025. Pennsylvania Freshwater Mussel Conservation Plan. Support from National Fish and Wildlife Foundation.
<https://waterlandlife.org/watershed-conservation/freshwater-mussel-conservation-plan/>

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Largest Dam Removal in Pennsylvania: Oakland Dam Removal, North Branch Susquehanna River

David Dippold

Fish Passage Biologist, Pennsylvania Fish and Boat Commission

Project Location: Susquehanna County, Oakland and Susquehanna Depot, North Branch of the Susquehanna River

Species of Greatest Conservation Need/Priority Habitat Affected

The removal of the Oakland Dam reconnected more than 250 miles of rivers and streams, restoring access to critical habitats for numerous sportfish, freshwater mussels and their hosts. This dam removal, combined with additional restoration efforts in the lower Susquehanna River will hopefully contribute to the northern restoration of historically important migratory species in the future. Migratory fishes are primary host fishes for both formerly abundant and SGCN mussel species (e.g., Elktoe, *Alasmodonta marginata*; Triangle Floater, *A. undulata*; Eastern Lampmussel, *Lampsilis radiata*; and Green Floater, *Platynaias subviridis*) which contribute ecosystem services such as water filtering capacity.

Project Purpose

In-stream barriers, such as dams, prevent the unrestricted movement of fish up and downstream and prohibit species from accessing critical habitats across seasons and/or life stages. Additionally, aging and



The Oakland Dam before, during, and after removal. This is the largest dam removal in Pennsylvania to date.

Photo credit: PFBC

obsolete dams can pose a risk to public safety and create dangerous conditions for boaters and paddlers. Dam removal is a high-value restoration and conservation action that can restore access to these habitats and eliminate public safety hazards.

Project Description

The Oakland Dam was originally constructed in the 1800s. The dam was enlarged to more than 755 feet in length and 16 feet high during the 1920s to provide electricity to a local railyard and hospital; however, the dam became obsolete by the 1990s and fell into disrepair, becoming a hazard to boaters and restricting aquatic organism passage. Through a collaborative partnership, led by American Rivers, the dam was removed in September 2023. This is the largest dam removal in Pennsylvania to date and was a key action in the long-term restoration of the Susquehanna River watershed - opening over 250 miles of reconnected habitat - and the numerous species the river supports.

Project Partners

Project partners include American Rivers, the Boroughs of Susquehanna and Oakland, Endless Mountains Heritage Region, Upper Susquehanna Coalition via Tioga County Soil & Water Conservation District, PA Department of Environmental Protection, PA Fish & Boat Commission, and the US Army Corps of Engineers. The project was funded by the US Fish & Wildlife Service, PA Department of Conservation and Natural Resources, PA Department of Community & Economic Development, River Bounty, and Susquehanna County.

References

<https://www.fws.gov/story/2023-10/largest-dam-removal-pennsylvania>

https://www.bayjournal.com/news/fisheries/oakland-dam-removed-from-susquehanna-river/article_4db28a4e-5ba9-11ee-825b-17ba294d87ef.html

<https://www.americanrivers.org/media-item/removal-of-oakland-dam-begins-with-benefits-for-public-safety-health-of-susquehanna-river/>

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A Long-Term, Coordinated Approach to Address Multiple Threats to the Allegheny Woodrat

Greg Turner

State Mammalogist, Pennsylvania Game Commission

Project Location: Statewide

Species of Greatest Conservation Need/Priority Habitat Affected

The state threatened Allegheny woodrat (*Neotoma magister*) is a habitat specialist and food generalist. Woodrats require deep voids within rock outcrops, cliffs, or talus slopes where they can find stable temperatures ranging from 40 to 55 degrees Fahrenheit year-round. These conditions help them avoid freezing in the winter and overheating in the summer, and act as a natural refrigerator. The dry, low humidity in these locations enables them to cache dried winter food stores for longer periods without decay. As an herbivore, they need diverse native plant communities peripheral to their rocky den spaces to produce a variety of food across the growing season.



Pennsylvania Game Commission team after translocating five Allegheny woodrats to a location in northwest Pennsylvania using soft release cages. Cages were placed deep in large voids of boulders as seen in the middle of the photo.

Photo credit: PGC

Historically, woodrats occupied hundreds of locations in Pennsylvania (Wright 2010). In the 1980s the first declines were noted in Connecticut and New York but, in the central portion of their range, declines were also found near anthropogenically created forest edge close to their occupied habitats further south. These mid-range sites held dozens of individuals in the 1980s, but by the 2000s were found to only host up to 6 individuals, seemingly as if carrying capacity was decreasing. Today, these sites are extirpated, with only 30% of historic populations now occupied in Pennsylvania. Declining food resources from deer over browsing, diseases, and loss of American chestnuts are hypothesized to be major factors. Anthropogenic fragmentation isolating once-connected populations is now reducing gene flow and causing genetic depression effects. The increased edge close to occupied habitats is also believed to be increasing a parasitic disease spread by raccoons.

Project Purpose

The project goal has been to address the three major factors of decline simultaneously and demonstrate that management actions can stabilize, or increase, declining populations.

Project Description

Pennsylvania woodrat recovery efforts initiated with a statewide survey in 2020 to assess the status of each metapopulation. The results sparked major concern as it documented a 70% overall loss of populations, with only four active metapopulations remaining (Moyer 2023). We began supplementally feeding (acorns, chestnuts) at a few core populations within each metapopulation. We simultaneously were live trapping to assess changes in abundance before and after feeding, but to also collect DNA and assess the genetic health of each population. We noted significant increases in abundance at each site where supplemental feeding was occurring, and this was coupled with an increase in the capture of weaned juveniles. Feeding was likely increasing pup survival rather than increasing the total number of young per litter. We also began to treat raccoon roundworm issues by placing anthelmintic baits several hundred yards outside of active woodrat habitat so that we would reduce the spread of the parasite inside the habitats, given that raccoons have a much larger territory and we aimed to treat the raccoons and not the woodrats.

We then began to address habitat from a long-term perspective. We began creating several different types of rock habitats adjacent to active sites to increase carrying capacity as well as to direct dispersal and genetic connectivity towards other proximate sites. We have begun fencing habitat near active rock to reduce food competition with deer and planting native vegetation to promote a more diverse food source. We also examined foods woodrats were naturally eating across several time periods during the year and adaptively managed our habitat management approach based on this information. For example, we noted a high diversity of mushrooms consumed by woodrats and have now created several areas where mushrooms are being promoted. Finally, to address issues of poor genetic variability, we began transferring individuals among sites. Because this was a regional problem, we created a woodrat working group and collectively have initiated a woodrat captive breeding program that now includes five zoos, with the goal to introduce captive reared young to alleviate genetic bottlenecks in active sites and, secondarily, to reintroduce them to key habitats long extirpated.

Project Partners

Zoos (Toledo, Baltimore, Hershey, Pittsburgh/ICC, Greensboro), Pennsylvania Department of Conservation and Natural Resources, Indiana University of Pennsylvania, Fort Indiantown Gap, Towson University

References

[*Our Threatened and Endangered Species: Allegheny woodrat*](#), an award-winning Pennsylvania Game Commission film documenting Allegheny woodrat recovery efforts

Moyer, C.M. 2023. Using passive monitoring to document Allegheny Woodrat (*Neotoma magister*) range contraction in Pennsylvania. Unpublished Master's thesis, Indiana University of Pennsylvania, Indiana, Pennsylvania.

Wright, J. In Steele, M.A., M.C. Brittingham, T. J. Maret, and J.F. Merritt, editors. 2010. Terrestrial Vertebrates of Pennsylvania: A Complete Guide to Species of Conservation Concern. The Johns Hopkins University Press, Baltimore, Maryland.

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Com-BAT-ting White-nose Syndrome

Greg Turner

State Mammalogist, Pennsylvania Game Commission

Project Location: Statewide. Focus sites in Greene, Fayette, Blair, Huntingdon, and Luzerne counties and expanding.

Species of Greatest Conservation Need/Priority Habitat Affected

Multiple Pennsylvania and U.S. endangered hibernating bat species suffering from white-nose syndrome (WNS); caves, mines, and tunnels

Project Purpose

To stabilize populations and promote initial recovery of rapidly declining bat species from WNS.

Project Description

WNS killed 99.9% of hibernating bats in Pennsylvania in a 4-year span. The Pennsylvania Game Commission was quick to document that survivors hibernating immediately after the mass mortality phase of WNS in Pennsylvania were using colder roosts than before the pathogen's presence. Previous studies showed that bats may select different temperatures to adjust the duration they remain in the state of hibernation, which impacts their energy stores across the winter season. With this knowledge, we worked with our partners to adjust hibernacula temperatures at several sites to mimic those temperatures sought by survivors. The colder temperatures in specific areas at some sites resulted an increase in species diversity and total abundance. The original manipulated site has become the state's 3rd largest hibernacula in total bats and the largest tricolored bat (*Perimyotis subflavus*) hibernacula in the state.



A gated borehole drilled into the back of a 1-mile long, single entrance railroad tunnel that is used by bats to hibernate. The venting steam from the back of the tunnel causes the main opening to draw in more cold winter air, cooling the site. *Photo credit: K. Wenner, PGC*

Project Partners

CNX Gas, DCNR, Temple University, Lock Haven University, and Cincinnati University

References

Turner, G. G., B. J. Sewall, M. R. Scafani, T. M. Lilley, D. Bitz, and J. S. Johnson. 2022. Cooling of bat hibernacula to mitigate white-nose syndrome. *Conservation Biology*. 36:e13803.



Advancing Pennsylvania Piping Plover Recovery

Cathy Haffner

Piping Plover Recovery Coordinator, Wildlife Recovery Conservation Planning Coordinator,
Pennsylvania Game Commission

Project Location: Presque Isle State Park, Erie

Species of Greatest Conservation Need/Priority Habitat Affected

Focus was on U.S. and Pennsylvania endangered Piping Plover (*Charadrius melodus*), but also benefitted Common Tern (*Sterna hirundo*) (PA endangered), Rufa Red Knot (*Calidris canutus rufa*) (U.S. threatened, PA threatened), and other shorebirds; Great Lakes beach and dune habitat



Photo credit: J. Dingel, PGC

Project Purpose

Restore and sustain an extirpated, federally endangered species to Pennsylvania for current and future generations.

Project Description

Piping Plovers, a globally rare, federally endangered Great Lakes shorebird tied to beach habitat, had been absent from Pennsylvania for about 50 years when three male birds showed interest in coming home in 2005. None stayed. In 2006, the Pennsylvania Game Commission (PGC) supported a Piping Plover recovery assessment, through a federal endangered species grant, to determine what measures, if any, could be taken to increase chances of the bird's potential return and recovery in Pennsylvania.

The recovery assessment highlighted vegetation management and partner coordination as primary ingredients to success (Haffner 2007). In 2011, the PGC garnered federal Great Lakes Restoration Initiative funding for invasive vegetation removal in the Gull Point Natural Area, a prime location for Piping Plover nesting. The State Park and Western Pennsylvania Conservancy initiated vegetation control efforts that continue today. Shorebird monitors, who ultimately started Erie Bird Observatory, regularly surveilled the site for plovers and documented effectiveness of vegetation removal (Haffner et al. 2014). A multiagency Pennsylvania Piping Plover and Common Tern Recovery Partnership, led by the PGC, has coordinated needs before and after each prospective nesting season since 2006. In 2017, eleven years after preparations began, two Piping Plover pairs returned to nest in Pennsylvania after a 62-year absence. Thanks to the tenacious team, Pennsylvania has supported 23 pairs and 57 fledglings through 2026, many of which have returned to Gull Point and other Great Lakes' sites to enhance this critically small population and support federal species recovery goals.

Project Partners

Pennsylvania Game Commission, U.S. Fish and Wildlife Service-Pennsylvania and Michigan Field Offices, Pennsylvania Department of Conservation and Natural Resources, Erie Bird Observatory, Western Pennsylvania Conservancy, U.S.D.A. Animal and Plant Health Inspection Service, U.S. Army Corps of Engineers-Buffalo District



Photo credit: T. Graziano, PGC

References

Haffner, C. D. 2007. Great Lakes Piping Plover (*Charadrius melodus*) Recovery Assessment, Presque Isle State Park, Erie Co., Pennsylvania. Submitted to Pennsylvania Game Commission, Harrisburg, Pennsylvania.

Haffner, C. D., S. Sargent, and E. Zimmerman. 2014. If we build it, will they come? Habitat restoration for the federally endangered Great Lakes Piping Plover (*Charadrius melodus*) at Presque Isle State Park, Erie County, Pennsylvania. *Pennsylvania Birds* 28 (1): 2-6.

[Our Threatened and Endangered Species: Piping Plovers](#), a Pennsylvania Game Commission film documenting the recovery story.