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September 8, 2025

SUBMITTED VIA EMAIL & THE ONLINE PNDI SYSTEM

Hope Brooks, Ecological Information Specialist
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry – Natural Heritage Section
400 Market Street, P.O. Box 8552
Harrisburg, PA 17015
c-hobrooks@pa.gov
RA-HeritageReview@pa.gov

Re: Botanical Survey Report Submission – PNDI No. 782938
State College Area Connector
Harris & Potter Townships, Centre County, Pennsylvania

Dear Ms. Brooks:

Skelly and Loy, Inc., *A Terracon Company* (Skelly and Loy), on behalf of Pennsylvania Department of Transportation (PennDOT) and the Federal Highway Administration (FHWA), is submitting the attached Botanical Survey Report for the State College Area Connector project for your review as requested.

The PennDOT, in cooperation with FHWA, proposes to improve roadway congestion and address safety issues along US 322 between Potters Mills and Boalsburg near State College in Centre County, Pennsylvania. The proposed State College Area Connector project is a transportation improvement project that aims to address roadway congestion caused by high peak hour traffic volumes on the US 322 roadway and intersections, safety concerns associated with the existing roadway configurations and traffic conditions and improve the roadway network and configuration which currently lacks continuity and does not meet driver expectations.

Protected species coordination for the proposed transportation improvement project was most recently updated by Skelly and Loy on January 8, 2025, via the Pennsylvania Natural Diversity Inventory (PNDI) online project review system. PNDI Receipt No. 782938 identified potential impacts to Hemlock Palustrine Forest as a special concern resource and an undisclosed sensitive species under the jurisdiction of the Pennsylvania Department of Conservation and Natural Resources (DCNR). DCNR issued a coordination letter on January 10, 2025, requesting a botanical survey be conducted for three plant species of concern during the appropriate survey window, as well as survey for the natural community of concern:

- Handsome Sedge (*Carex formosa*) – Current PA Status: Endangered
- Roundleaf Serviceberry (*Amelanchier sanguinea*) – Current PA Status: Endangered
- Declined Trillium (*Trillium flexipes*) – Current PA Status: Threatened
- Hemlock Palustrine Forest – Current PA Status: Special Concern Resource

Skelly and Loy botanists conducted the botanical survey for the target species and natural community of concern within the project area in April & May 2025. Eight (8) environmental scientists spent approximately 380 field-hours investigating the forested habitat present in the project area. Approximately, eighty-four (84) properties encompassing a total of 1,379 acres were surveyed for potential habitat and searched for the target species of concern, and occurrences of Hemlock Palustrine Forest. Of the total 1,379 acres surveyed, 410 acres consisted of potential habitat dominated by forested communities with shrub components. An additional nine (9) parcels were not surveyed due to restricted property access. Particular attention was paid to the potential habitat types including forested slopes, remnant woods, wide hedgerows, floodplain and riparian areas, and palustrine scrub-shrub (PSS) / palustrine forested (PFO) wetlands. All surveying events were conducted during the flowering periods of the target plant species of concern.

- ***Target Species of Concern*** – No occurrences of three target species of concern were identified within the project area. Suitable habitat for all three (3) target species of concern exists within the project area; however, no occurrences of these species were observed during the botanical survey. The majority of the project area consists of rural and commercial residential properties, farm operations, agricultural fields, and paved roadways. The forest remnants and hedgerows throughout the project study area were dominated by invasive shrub species, and establishment of these three target species is unlikely.

- ***Non-Target Species*** - An occurrence of Goldenseal (*Hydrastis canadensis*) was identified within the project area in [redacted]. The population was documented as part of the botanical survey field effort and is detailed in the Botanical Survey Report. Goldenseal is a state-listed vulnerable species. Vulnerable species are plant species which are in danger of population decline within the Commonwealth of Pennsylvania because of their beauty, economic value, use as a cultivar, or other factors which indicate that persons may seek to remove these species from their native habitats.

    - The proposed project alternatives may result in direct impacts to the remanent woods where this population of Goldenseal is located. The current private property owner was not aware of the population on their property and expressed no interest in conserving the population.

- ***Natural Community of Concern*** - The project area contains approximately 50 acres of this Palustrine Hemlock Forested community, which coincides with [redacted] previously identified by DCNR as special concern resource. However, the botanical survey field effort was not able to field confirm the riparian forest community composition due to [redacted]. The wetland and watercourse delineation field investigation conducted in 2023 identified the [redacted] wetland complex features. No additional occurrences of Palustrine Hemlock Forest communities were identified within the project area.

    - Based on aerial imagery and wetland delineation field observations, the Hemlock Palustrine Forest is located [redacted]

[redacted]; therefore, the Hemlock Palustrine Forested identified by DCNR, will not be impacted by the project.

Based on the results of the botanical survey, the proposed State College Area Connector project is not anticipated to impact the target species of concern under the jurisdiction of DCNR. The conceptual design alternatives propose to avoid impacts to the known Palustrine Hemlock Forest community [redacted] to the greatest extent practicable.

The official DCNR response will be included in the project's Environmental Impact Statement (EIS) and the necessary permit applications to regulating agencies. Please review the enclosed botanical survey report and supporting information, and feel free to contact Samantha Hockenberry at 717-237-2898 or via email shockenberry@skellyloy.com, if you have any questions. We look forward to coordinating with you on this project.

Sincerely,
Skelly and Loy, Inc., *A Terracon Company*

Samantha R. Hockenberry, PWS, CE
Senior Scientist / Botanist
Environmental

Paul J. DeAngelo
Senior Principal / Vice President
Environmental Lead
Operations Manager, Harrisburg

Enclosures:
1. Botanical Survey Report (August 2025)

cc: Jesse Sabitsky, PennDOT Central Office
Nicole Auker, PennDOT Central Office
Chris Peacock, PennDOT District 2-0
Eric Munyack, PennDOT District 2-0
Lori Cole, JMT
Kevin James, Michael Baker
Alyssa Lynd, Skelly and Loy
Jim Sinclair, Skelly and Loy

File: JN197202

state college area
CONNECTOR

PennDOT.gov/SCAC

Botanical Survey Report

Carex formosa **- Handsome Sedge**

Amelanchier sanguinea **- Roundleaf Serviceberry**

Trillium flexipes **- Declined Trillium**

Palustrine Hemlock Forest

State College Area Connector

Harris & Potter Townships
Centre County, Pennsylvania

pennsylvania
DEPARTMENT OF TRANSPORTATION

U.S. Department of Transportation
Federal Highway Administration

August 2025

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Appendices

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List of Acronyms

AMSL	Above Mean Sea Level
CE	Certified Ecologist
DCNR	Pennsylvania Department of Conservation and Natural Resources
EIS	Environmental Impact Statement
FCQP	Forest Conservation Qualified Professional
FHWA	Federal Highway Administration
NEPA	National Environmental Policy Act
OSHA	Occupational Safety and Health Administration
PA 45	Pennsylvania Route 25
PA 144	Pennsylvania Route 144
PEL	Planning and Environmental Linkages
PEM	Palustrine Emergent
PennDOT	Pennsylvania Department of Transportation
PFO	Palustrine Forested
PNHP	Pennsylvania Natural Heritage Program
PNDI	Pennsylvania Natural Diversity Inventory
PSS	Palustrine Scrub-Shrub
PWS	Professional Wetland Scientist
US 322	U.S. Route 322
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey

1.0 Introduction

The Pennsylvania Department of Transportation (PennDOT), in cooperation with the Federal Highway Administration (FHWA), proposes to improve roadway congestion and address safety issues along U.S. Route 322 (US 322) between Potters Mills and Boalsburg near State College in Centre County, Pennsylvania. The proposed State College Area Connector project is a transportation improvement project that aims to address roadway congestion caused by high peak hour traffic volumes on the US 322 roadway and intersections, safety concerns associated with the existing roadway configurations and traffic conditions and improve the roadway network and configuration which currently lacks continuity and does not meet driver expectations.

1.1 Project History from PEL Study to EIS

The State College Area Connector Planning and Environmental Linkages (PEL) Study identified transportation needs within southern Centre County, Pennsylvania in a 70 square mile initial study area. The study evaluated a range of alternatives to determine how the alternatives addressed the Study's purpose and need, balanced impacts on the natural and built environment, addressed traffic concerns within the overall study area, met engineering considerations such as constructability, cost, and considered area planning goals. The PEL Study screened nine corridors to determine the best options to advance for National Environmental Policy Act (NEPA) evaluation and preliminary engineering. Based on the impact analysis, three corridors were identified (US 322-1S, US 322-1OEX and US 322-5) to be advanced as reasonable alternatives, and a specific project area was developed to initiate detailed field investigations and conduct preliminary engineering investigations to address the transportation purpose and needs as part of the NEPA process.

The final PEL Report was published in June 2023 and FHWA acknowledged in a letter, dated September 14, 2023, that the PEL Study was consistent with 23 USC Section 168 and 23 CFR 450.212. As a result, the PEL findings provide a starting point for the NEPA studies and preliminary engineering efforts. Additionally, FHWA concurred that an Environmental Impact Statement (EIS) was the proper NEPA classification for the State College Area Connector project.

The PEL Study also identified other transportation projects which did not meet the full purpose and need identified in the PEL but could provide transportation benefits to the study area roadways independently. One such project was a safety study along Pennsylvania Route 45 (PA 45) generally from Boal Avenue to Pennsylvania Route 144 (PA 144). Subsequent to the PEL completion, additional traffic investigations and analysis and coordination with local officials for the State College Area Connector project determined that the connector road and interior interchange would provide some localized improvements to PA 45. However, it was determined that the connector road and associated interchange was not necessary to address the project's purpose and need, nor did it address corridor wide issues along PA 45. As a result, the proposed interior interchange and local road connection was removed from this State College Area Connector project and will be considered in the independent PA 45 Corridor Improvements project, as appropriate. The State College Area Connector project will advance independently but will not preclude the inclusion of a future interior interchange and local road connection should the independent safety study along PA 45 determine that it would be beneficial in connection with other proposed PA 45 Corridor Improvements project.

Following the PEL Study, the project area was reduced from 70 square miles to approximately 6 square miles to encompass the three alternatives proposed to move forward into preliminary engineering.

1.2 Alternatives

The three alternatives that were recommended in the PEL Study to move forward into the NEPA phase of the project were renamed to North, Central and South. Following public and agency involvement, refinements were made to all three alternatives.

1.4.1. North Alternative

The western end alignment would be the same for all three alternatives, from the SR 45 interchange to just east of the Mountain View County Club. At the western end, the existing US 322 would remain in its current location and the new US 322 4-lane highway would be on the south side of the existing US 322. The western end alignment would also include a pedestrian/bicycle trail on the north side of the existing US 322. Just east of the Mountain View Country Club, the alignment would start to move north of the existing US 322 through the Nittany Farm and around the Kuhn tree farm. It would continue through the agricultural fields on the north side of US 322, avoiding the commercial area on US 322 in Potter Township. The alignment would return to the existing US 322 alignment through Tusseyville. The eastern end would maintain the existing US 322 as the local access road in its current position and the 4-lane highway alignment would be on the south side of the existing US 322 from approximately Tusseyville to Potters Mills.

1.4.2. Central Alternative

The western end alignment would be the same for all three alternatives, from the SR 45 interchange to just east of the Mountain View Country Club. At the western end, the existing US 322 would remain in its current location and the new US 322 4-lane highway would be on the south side of the existing US 322. The western end alignment would also include a pedestrian/bicycle trail on the north side of the existing US 322. Just east of the Mountain View Country Club, the alignment would start to move north of the existing US 322 through the Nittany Farm and around the Kuhn tree farm. It would then cross over the existing US 322 and travel south of the Potter Township Athletic Complex on the south side of US 322, avoiding the commercial area in Potter Township.

It is noted that at the time of the May 8, 2025 Public Meeting, the Central Alternative was located through the baseball fields within the Potter Township Athletic Complex. As part of the public involvement and follow-up from the public meeting, Potter Township issued a letter (June 23, 2025) to PennDOT raising concern with the proposed impact to the fields and requested PennDOT consider avoidance and minimization of the property. PennDOT shifted the Central Alternative to the south to avoid the baseball fields and will only impact the undeveloped portion of the Potter Township property.

From there, the alignment then crosses Sleepy Creek, a stream that drains to the Tussey Sink area, and flows north towards the existing US 322. The alignment returns to the existing US 322 alignment near Tusseyville. The eastern end would maintain the existing US 322 as the local access road in its current position and the 4-lane highway alignment would be on the south side of the existing US 322 from approximately Tusseyville to Potters Mills.

1.4.3. South Alternative

The western end alignment would be the same for all three alternatives, from the SR 45 interchange to just east of the Mountain View County Club. At the western end, the existing US 322 would remain in its current location and the new US 322 4-lane highway would be on the south side of the existing US 322. The western end alignment would also include a pedestrian/bicycle trail on the north side of the existing US 322. Just east of the Mountain View Country Club, the alignment would start to move south of the existing US 322 through the Tait Farm and along the side of the Tussey

Mountain Ridge (Tussey Ridge) behind the neighborhoods and communities along the south side of the existing US 322. It would then cross over Sleepy Creek (stream that drains to Tussey Sink) and start to move north towards the existing US 322. The alignment would return to the existing US 322 alignment near Tusseyville. The eastern end would maintain the existing US 322 as the local access road in its current position and the 4-lane highway alignment would be on the south side of the existing US 322 from approximately Tusseyville to Potters Mills.

2.0 Report Purpose

This report presents the results of the botanical survey conducted within and immediately adjacent to the project area for the North, Central, and South Alternatives, for the plant species and natural community of concern listed in the tables below.

Table 1. Plant Species of Concern

Scientific Name	Common Name	Current PA Status	Proposed PA Status
Carex formosa	Handsome Sedge	Endangered	Endangered
Amelanchier sanguinea	Roundleaf Serviceberry	Special Concern Species	Endangered
Trillium flexipes	Declined Trillium	Special Concern Species	Threatened

Table 2. Natural Communities of Concern

Community Name	Description	Current PA Status	Proposed PA Status
Hemlock Palustrine Forest	Riparian corridor along Sinking Creek, site includes wetlands as well as immediately adjacent lands.	Special Concern Resource	Special Concern Resource

Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt No. 782938 identified potential impacts to Hemlock Palustrine Forest as a special concern resource and an undisclosed sensitive species under the jurisdiction of the Pennsylvania Department of Conservation and Natural Resources (DCNR). DCNR issued a coordination letter on January 10, 2025 requesting a botanical survey be conducted to identify occurrences of three plant species of concern (**Table 1**) and the natural community of concern (**Table 2**) that may be present within the project area. The project's PNDI Receipt and DCNR Coordination Letter are provided in **Appendix A**.

3.0 Study Area Description

The proposed State College Area Connector project is located in Pennsylvania's the Ridge and Valley Physiographic Province. The EIS project area contains the preliminary limits of disturbance for the project's three alternatives, as well as a 100-foot buffer along each alternative's limit of disturbance. In total, the EIS project area encompasses approximately 3,963 acres and contains the existing US 322, local roads, farm operations, agricultural fields, rural

commercial and residential properties, forested slopes, hedgerows, remnant woods, palustrine wetland complexes, and riparian corridors.

According to the U.S. Geological Survey (USGS) 7.5 minute topographic quadrangle map (State College & Centre Hall, Pennsylvania), the elevation of the project area ranged from 1,100 feet above mean sea level (amsl) along the western extent of the project area to 1,600 feet amsl at the southern extent of the project area. An excerpt from the USGS Topographic Quadrangle Map is provided as **Figure 1**.

3.1 Geology and Soil Conditions

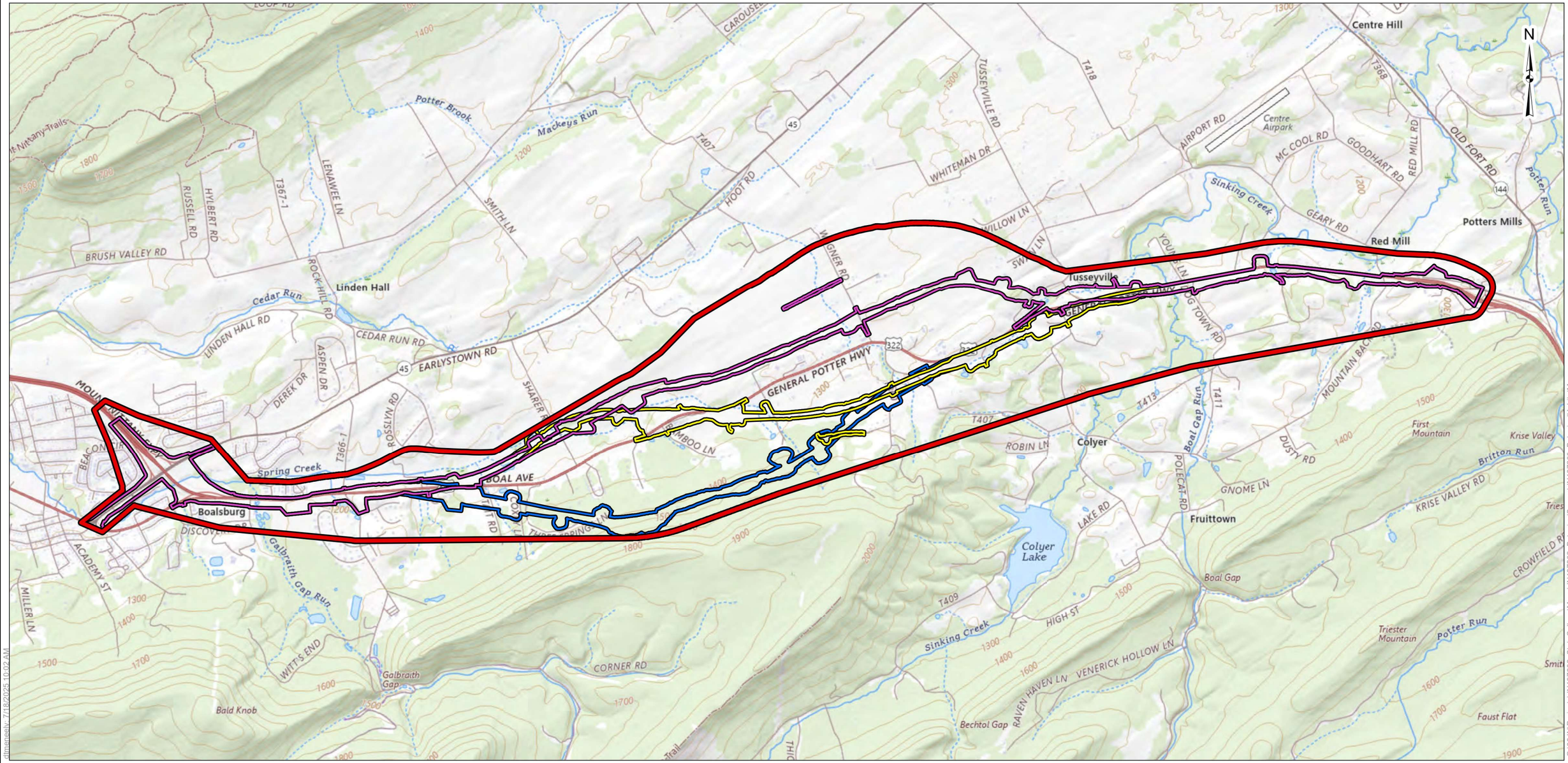
The project area is located in the Appalachian Mountain Section of the Ridge and Valley Physiographic Province in Pennsylvania (DCNR, 2000). This physiographic section is characterized by long, narrow ridges and broad to narrow valleys and underlain by sandstone, siltstone, shale, conglomerate, limestone, and dolomite. The landforms and geology of this physiographic province originated from fluvial erosion, solution of carbonate rocks, and some periglacial mass wasting during the Ordovician Period (443 to 490 million years ago). The project area is underlain by six bedrock geologic formation units that are outlined in **Table 3** and are shown on **Figure 3**. Of these six geologic formations, limestone is the main rock type in three formations (Oa, Obl, & Ocn) and dolomite is the main rock type in one formation (Obf).

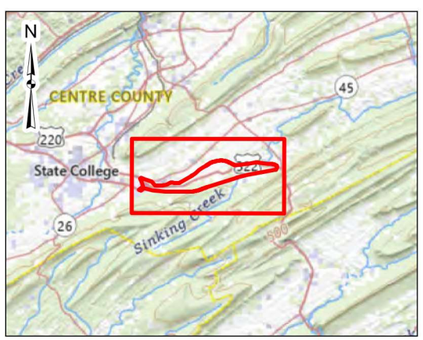
Often derived from limestone and dolomite, calcareous soils are a distinctive soil type characterized by high calcium carbonate ($CaCO_3$) content, which gives these soils unique physical and chemical properties. Calcareous soils are often alkaline and have a chalky texture. Calcareous soils can be deficient for some nutrients including phosphorus, zinc, and iron. Calcareous soils are common in areas with karst topography. Plant communities that prefer or thrive in calcareous soils may have specialized root systems or symbiotic relationships with mycorrhizal fungi, that allow the plant to access and efficiently absorbed the limited nutrients available from the soil. Plant species that prefer calcareous soils conditions, are often slow-growing, generally long-lived, and tend to be sensitive to soil conditions. Calcareous soils would likely be present in western extent, north and central portions of the project area that are mapped as being underlain by limestone-dominated bedrock geology formations (Oa, Obf, Obl, Ocn) and contain karst topography.

Table 3. Project Area Bedrock Geology

Formation Symbol	Formation Name	Description	Main Rock Type
Oa	**Axemann Formation**	• Located in the northcentral portion of the project area and at the western extent near Boalsburg, 2% of the project area is underlain by this formation. • This formation is composed of light-gray, fossiliferous, coarsely crystalline grained limestone interbedded with silty, fine-grained dolomitic limestone, and also contains oolitic and conglomeratic limestone, as well as concentrations of flint and chert.	Limestone
Obf	**Bellefonte Formation**	• Located in the northcentral portion of the project area and the western portion at the US 322 interchange with PA 45 near Boalsburg, 24% of the project area is underlain by this formation. • This formation consists of light- to medium-gray, tan weathering, very grained dolomite at its top and at its base, it consists of minor sandstone beds, some chert, and medium-gray, medium crystalline dolomite.	Dolomite

Table 3. Project Area Bedrock Geology			
Formation Symbol	**Formation Name**	**Description**	**Main Rock Type**
Obl	**Benner Formation**	• Located in the central portion of the project area along US 322 and at the western portion near Boalsburg, 13% of the project area is underlain by this formation. • This formation consists of light- to dark-gray, very finely crystalline limestone and is comprised of three distinct formation members. At the top is the Valentine Member consisting of a light- to dark-gray, very finely crystalline, high calcium limestone. Situated next is the Valley View Member which consists of argillaceous limestone containing metabentonite beds. At the base is the Stover Member consists of a dark-gray limestone having dolomite streaks. • This formation has also been referred to as the Linden Hall Formation.	Limestone
Ocn	**Coburn Formation**	• Located across the project area from Boalsburg to the Tusseyville area, as well as the eastern extent near Potters Mills Gap, 23% of the project area is underlain by this formation. • This formation consists of medium-gray to very dark gray, fossiliferous limestone and shaly limestone.	Limestone
Or	**Reedsville Formation**	• Located in the western portion of the project area near Boalsburg and along the southern project area boundary extending east through the project area near Potters Mills Gap, 37% of the project area is underlain by formation. • This formation consists of dark-gray shale containing thin sandy to silty shale and siltstone interbeds, and it has an upper fossiliferous sandstone.	Shale
Obe	**Bald Eagle Formation**	• Located along the project area's southern boundary, <1% of the project area is underlain by this formation. • This formation consists of gray to reddish-gray to brownish gray, fine to coarse-grained, cross-bedded sandstone, siltstone, shale, and quartz-pebble conglomerate.	Sandstone





Legend

- Project Area
- North Alternative
- Central Alternative
- South Alternative

Feet
0 1,500 3,000 6,000

DATA SOURCE(S):
USGS Quadrangle - Centre Hall and State College, Pennsylvania 2023

Project No.:	JN197202
Date:	July 2025
Drawn By:	DTM
Reviewed By:	ARL

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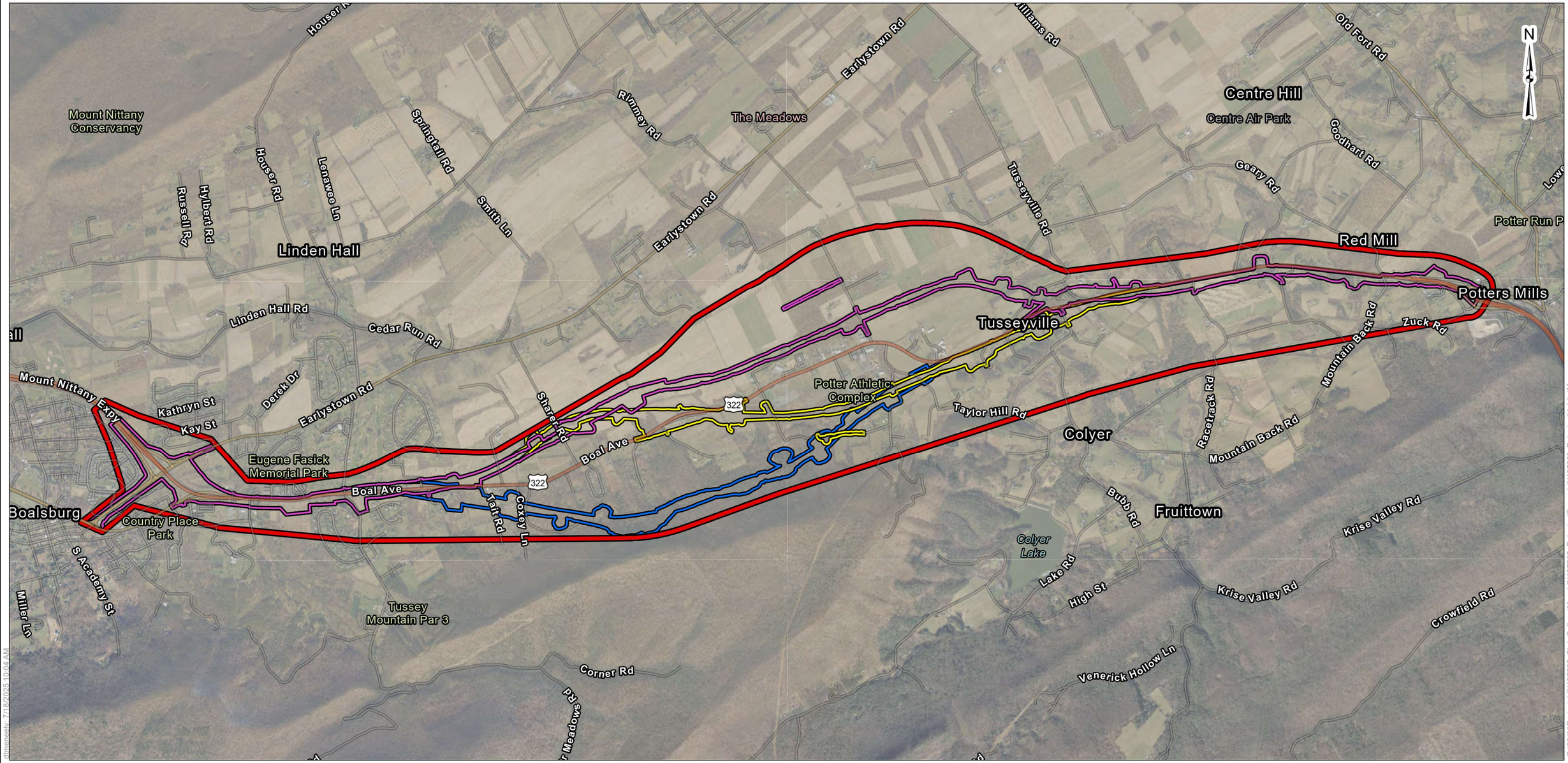
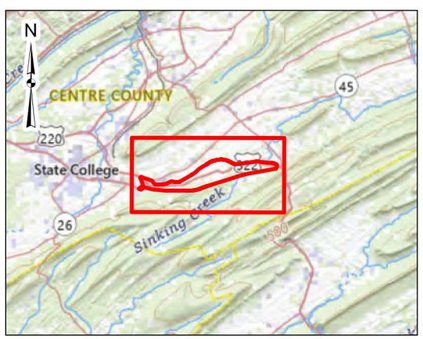
USGS Topographic Location Map

State College Area Connector Project
Centre County, Pennsylvania

Figure

1





Legend

- Project Area
- North Alternative
- Central Alternative
- South Alternative

Feet
0 1,500 3,000 6,000

Project No.:	JN197202
Date:	July 2025
Drawn By:	DTM
Reviewed By:	ARL

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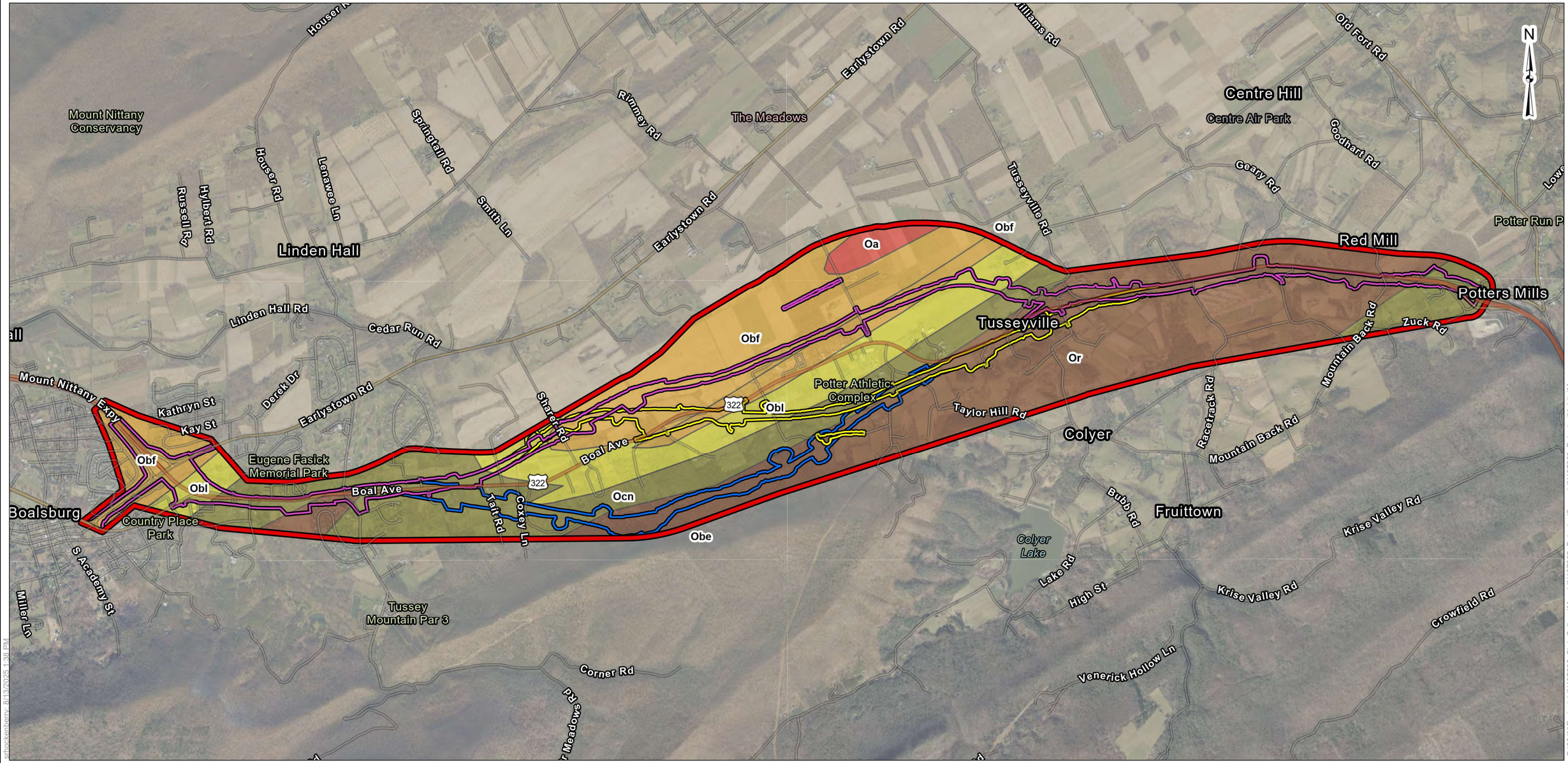
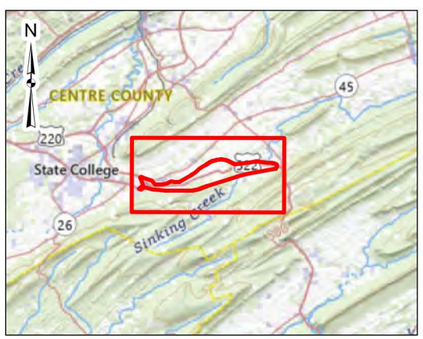
Project Area Map

State College Area Connector Project
Centre County, Pennsylvania

Figure

2





Legend

- Project Area
- North Alternative
- Central Alternative
- South Alternative
- Ordovician Axemann Formation - Oa
- Ordovician Bald Eagle Formation - Obe
- Ordovician Bellefonte Formation - Obf
- Ordovician Benner Formation - Obl
- Ordovician Coburn Formation - Ocn
- Ordovician Reedsville - Or

Feet
0 1,500 3,000 6,000

Project No.:	JN197202
Date:	August 2025
Drawn By:	JMO
Reviewed By:	DTM

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Project Area Bedrock Geology

State College Area Connector Project
Centre County, Pennsylvania

Figure

3

4.0 Plant & Natural Community Descriptions

4.1 Roundleaf Serviceberry (*Amelanchier sanguinea*)

The Pennsylvania Natural Heritage Program describes *Amelanchier sanguinea* as a low, arching shrub or small tree that ranges from 3 to 8 feet tall with a single, slender trunk, and reddish-brown twigs. They are usually clumped but do not form colonies. Their leaves are alternate, simple, deciduous, and coarsely toothed, mostly above the middle. Their leaves have lateral veins extending into the teeth. Their flowers, which are described as having five white petals that are in the shape of long drooping racemes, are 11 to 15 mm long, and are grouped in small clusters that appear from late April to mid-May. The fruits resemble miniature apples and are reddish to purple when mature.


Amelanchier sanguinea (in flower)
Source: Smith, R.W. (2012), Lady Bird Johnson Wildflower Center

Distribution and Habitat:

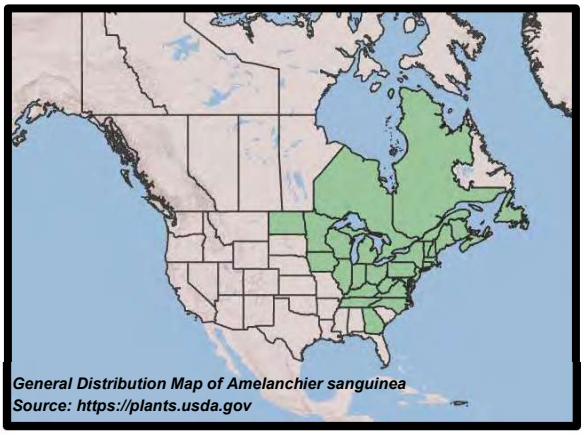
Amelanchier sanguinea has a distribution range from Ontario and New York south to Tennessee, Alabama, and South Carolina. In Pennsylvania, it is currently known to occur in 11 southeastern counties. Historically, they are known to occur in 4 counties. Centre County is one of the counties in which its occurrence is historically known. The species is known to grow in rich, moist woods and thickets with rocky, clay soils.


Amelanchier sanguinea (twig/bud)
Source: Virginia Tech Dendro

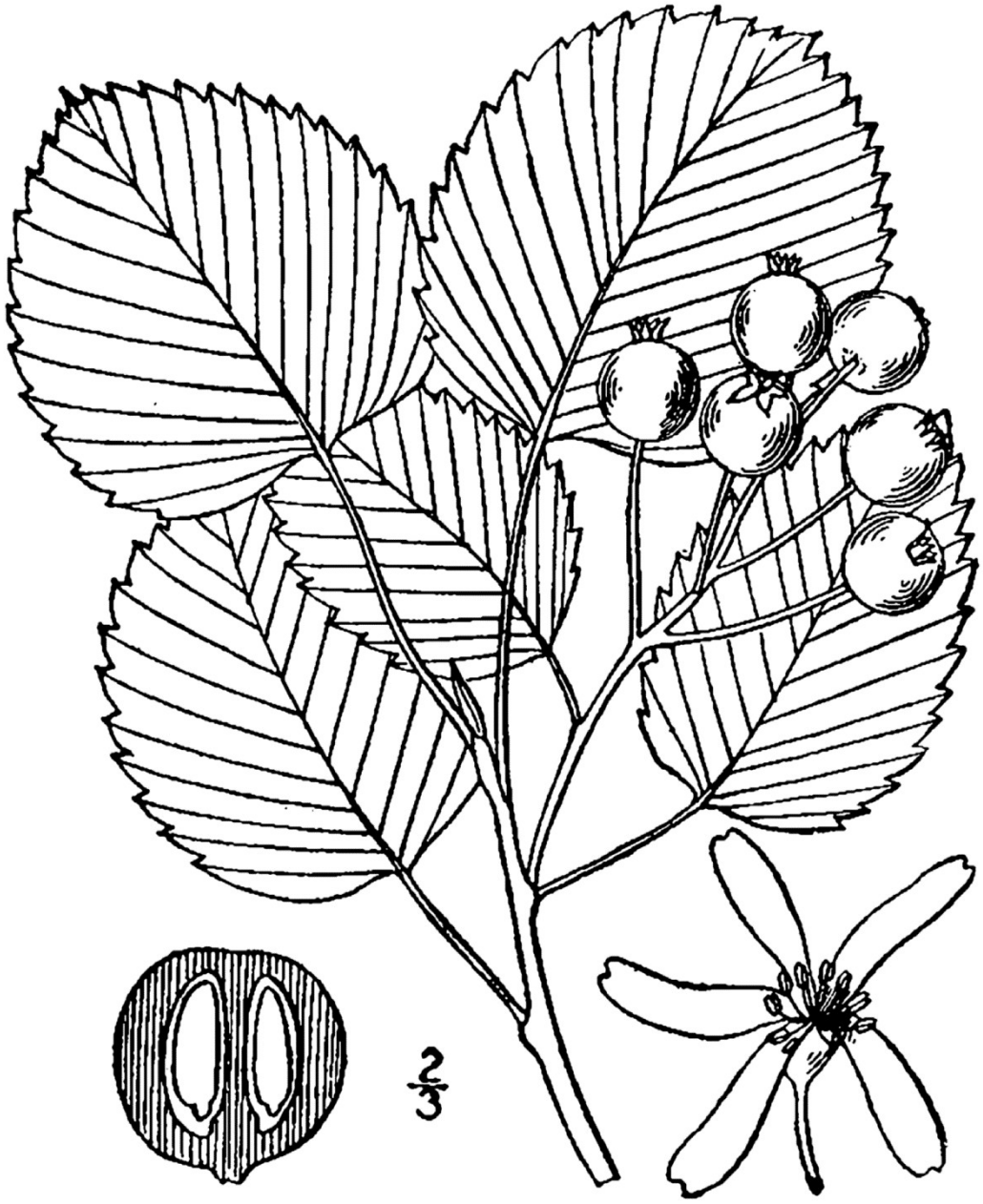

Amelanchier sanguinea (bark)
Source: Virginia Tech Dendro

Current and Proposed State Status:

In Pennsylvania, legal status for *Amelanchier sanguinea* is tentatively undetermined. The Proposed Status for the species is “Endangered”.


General Distribution Map of Amelanchier sanguinea
Source: https://plants.usda.gov


Amelanchier sanguinea (fruit)
Source: Photo by Gary P. Fleming,
Flora of the Southeastern United States; NC Botanical Garden



Amelanchier sanguinea

Source: USDA PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated FLORA of the northern United States, Canada and the British Possessions*. 3 vols. Kentucky Native Plant Society, New York.

4.2 Handsome Sedge (*Carex formosa*)

Plants of Pennsylvania describes *Carex formosa* as a perennial graminoid with fertile shoots 3 to 8 dm tall. The base is reddish and is wrapped in a sheath that is hairy instead of fibrous. Their leaf sheaths and blades are pilose. The blades are 3-8 mm wide Their blades are 3-8 mm wide, with the sheaths of the lower bracts 1.5 to 6 cm. Terminal spikes are largely male with a few perigynia above. The pistillate scales are acute to obtuse looking. The perigynia is ascending, sessile, and obscurely 3-angled in cross section with 2-3 strong nerves. Their achenes are sessile. Their beaks are gradually tapered, reaching 0.3 to 0.6 mm long. Fruit develops in late spring through mid-summer, with the pistillate spikes forming clusters of seeds, wrapped in perigynium, and subtended by a scale.


Carex formosa (in flower)
Source: Photo by New York Natural Heritage Program

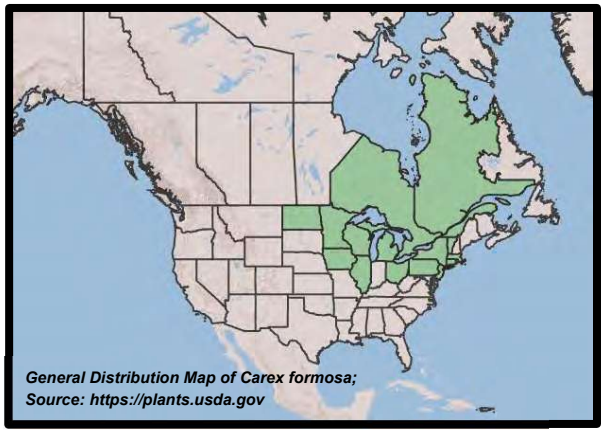
Distribution and Habitat:

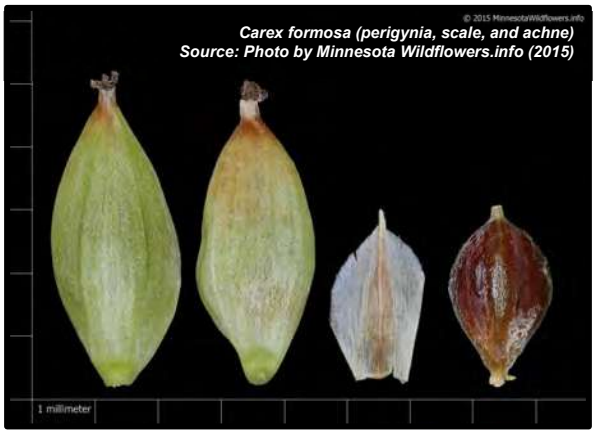
Carex formosa has a wide distribution range including Quebec and Ontario, Canada down towards North Dakota and south to New Jersey, Pennsylvania, Ohio, Illinois, and Minnesota. In Pennsylvania, it is only known to occur in one county. Centre County is the only county in which its occurrence is known. The species is known to grow in dry , deciduous forests and ravines, moist meadows, and land with calcareous soils.


Carex formosa (individual plant base and hairs)
Source: Photo by New York Natural Heritage Program

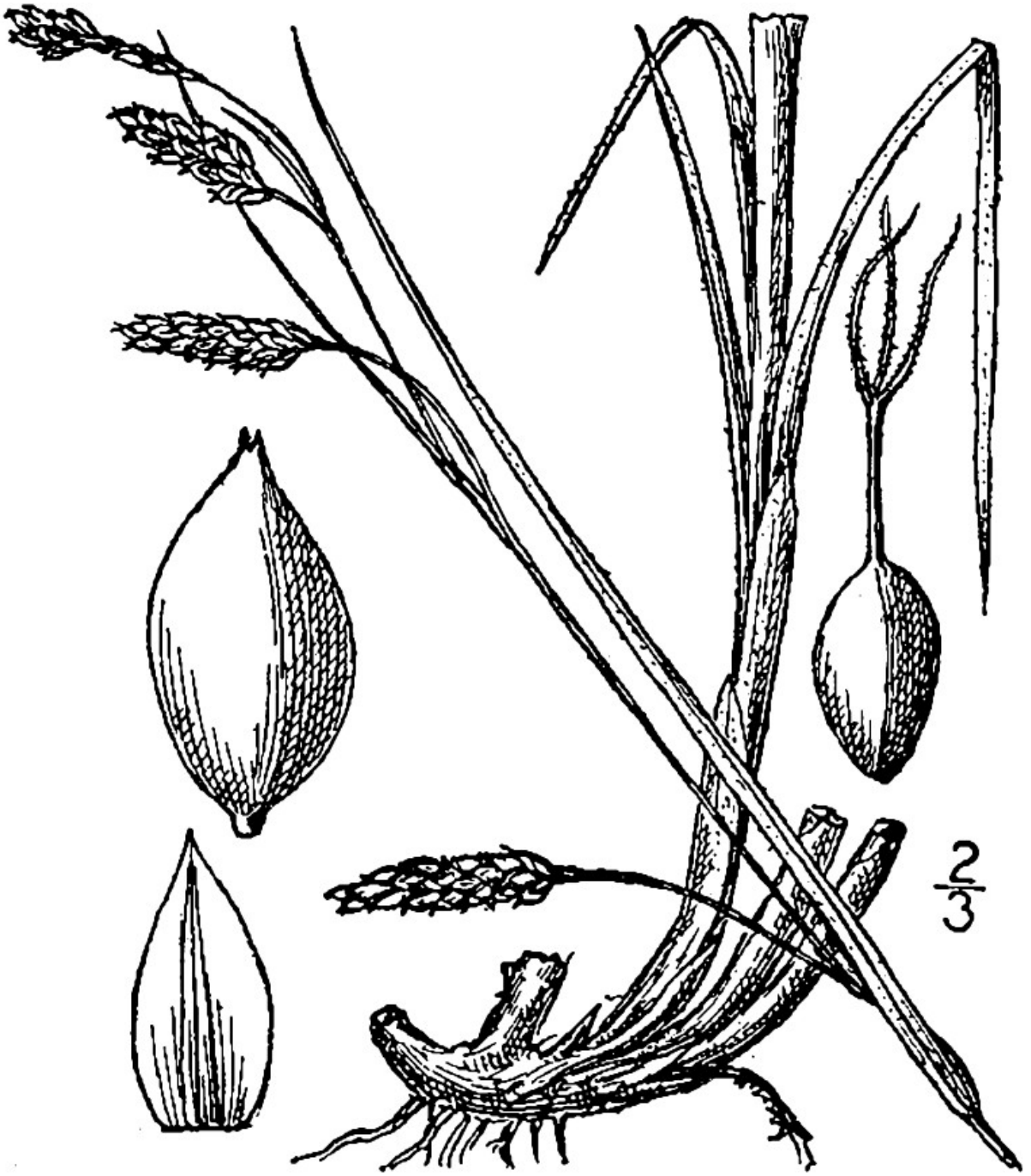
Current and Proposed State Status:

In Pennsylvania, legal status for *Carex formosa* is Endangered. The Proposed Status for the species is to remain “Endangered”.


General Distribution Map of Carex formosa;
Source: https://plants.usda.gov



Carex formosa (perigynia, scale, and achne)
Source: Photo by Minnesota Wildflowers.info (2015)



Carex formosa

Source: USDA PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated FLORA of the northern United States, Canada and the British Possessions*. 3 vols. Kentucky Native Plant Society, New York.

4.3 Declined Trillium (*Trillium flexipes*)


Trillium flexipes (in flower)
Source: Photo by Thomas G. Barnes, USDA-NRCS

Trillium flexipes is an herbaceous plant that grows up to 15.75 inches (40 cm) tall. Leaves are or nearly sessile with acuminate tips and range from ovate to rhombic in shape. Flowers grow on peduncles that range from 0.75 to 2.5 inches (2 to 6 cm) tall and either spread or decline. Flowers are typically white but may be pink and typically lack a strong odor. Flowers can appear above or below the leaves. The flower's ovaries are typically white or pink.

According to *The Plants of Pennsylvania* (Rhoads and Block, 2007), this species may hybridize with *Trillium erectum* in the lower Susquehanna Valley of Pennsylvania. While *Trillium erectum*'s leaves and peduncles are identical in shape and size *to Trillium flexipes*, the flowers are typically maroon with an offensive smell and typically have maroon ovaries, though their flowers sometimes may be white. Those identified as potential hybrids in the preserve, identified as Trillium *erectum x flexipes*, or Susquehanna trillium by Lancaster Conservancy, only differ from *T. flexipes and T. erectum* by having maroon ovaries with white flowers.

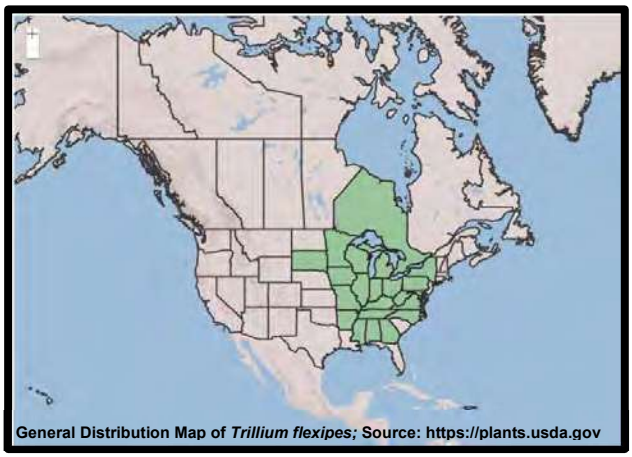

Trillium flexipes (in flower)
Source: Photo by The Frieshner Herbarium, Butler University

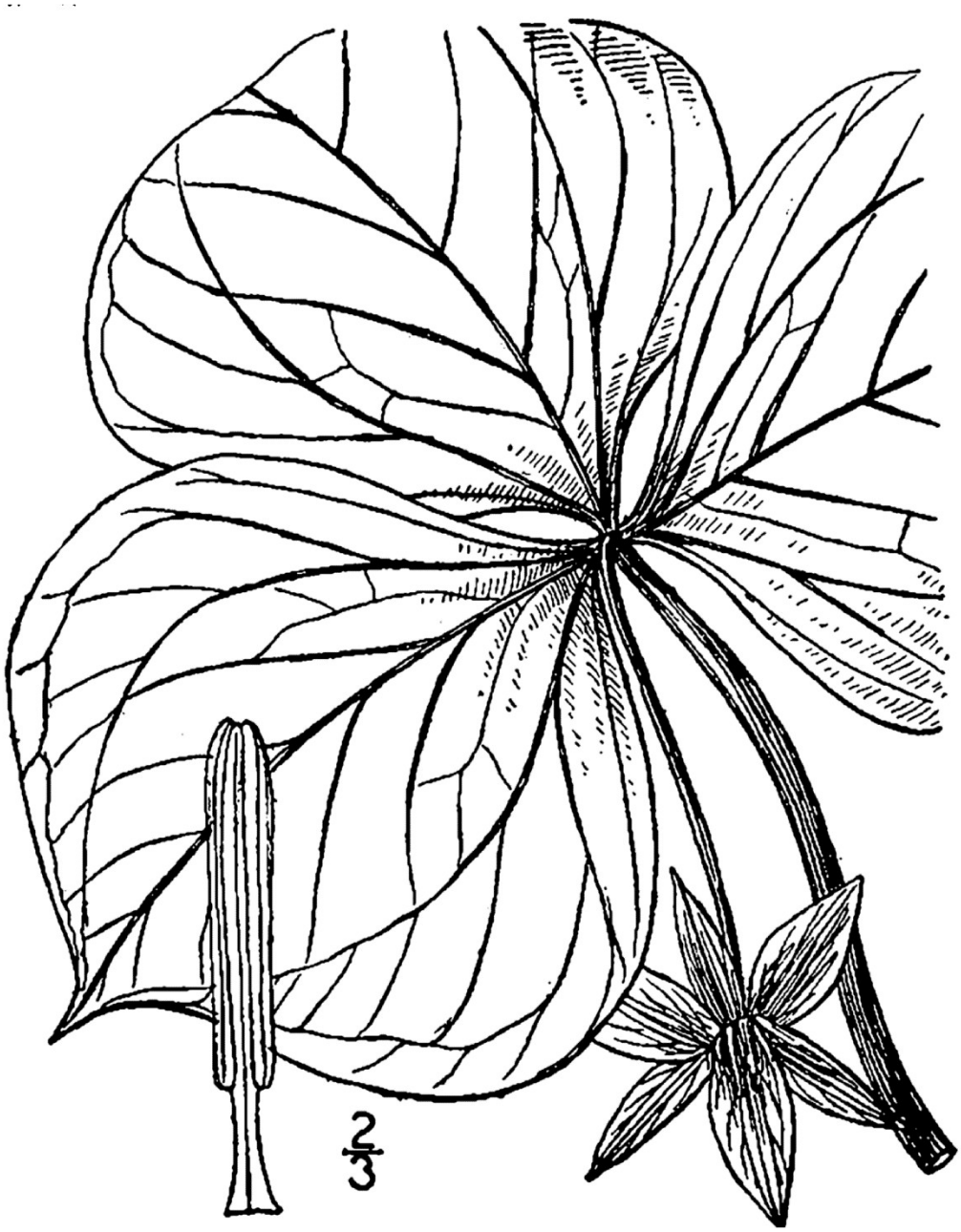
Distribution and Habitat:

Trillium flexipes has a distribution from Ontario south to Georgia, east to New York, and west to South Dakota. According to the U.S. Department of Agricultural (USDA) PLANTS Database, this trillium species is known to occur in eleven (11) counties in Pennsylvania, mostly the western part of the state and counties along the Susquehanna River. The species is known to prefer wooded hillsides, swampy woods, and floodplains. It flowers from late April into early May.

Current and Proposed State Status:

In Pennsylvania, legal status for *Trillium flexipes* is tentatively undetermined. The Proposed Status for the species in Pennsylvania is "Threatened".


General Distribution Map of *Trillium flexipes;* Source: https://plants.usda.gov



Trillium flexipes

Source: USDA PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated FLORA of the northern United States, Canada and the British Possessions*. 3 vols. Kentucky Native Plant Society, New York.

4.4 Hemlock Palustrine Forest


Palustrine Hemlock Forest
Photo by PNHP

Hemlock Palustrine Forest is considered a unique forest community that occurs on saturated soils in basins or depressions on the fringe of inundated areas or in backwater areas along rivers. This community type may occur as a zone around a wetter community type. It may also occur in basins or slopes fed by groundwater seepage. There is often a pronounced hummock and hollow microtopography present within this forest community. The hemlock trees found in these communities may persist in the inundated and extremely saturated portions of these depressions, basins, and backwaters, by growing on hummock microtopography.


Palustrine Hemlock Forest
Photo by PNHP

As indicated by the name, eastern hemlock (*Tsuga canadensis*) is a dominant species in this forest community, which may also contain a mixture of other conifers including red spruce (*Picea rubens*), tamarack (*Larix laricina*), and eastern white pine (*Pinus strobus*). Hardwood species may contribute up to 25% of the canopy with common species that include red maple (*Acer rubrum*), yellow birch (*Betula alleghaniensis*), and black ash (*Fraxinus nigra*). Great Laurel Rhododendron (*Rhododendron maximum*) is often present and can be quite dense in the understory. Other shrub species commonly associated with Hemlock Palustrine Forests include withe-rod (*Viburnum cassinoides*), swamp azalea (*Rhododendron viscosum*), winterberry (*Ilex verticillata*), and highbush blueberry (*Vaccinium corymbosum*). Understory herbeacous species include cinnamon fern (*Osmunda cinnamomea*), skunk cabbage (*Symplocarpus foetidus*), sensitive fern (*Onoclea sensibilis*), partridgeberry (*Mitchella repens*), Canada mayflower (*Maianthemum canadense*), goldthread (*Coptis trifolia*), violets (*Viola* spp.), dewdrop (*Dalibarda repens*), starflower (*Trientalis borealis*), and various grasses and sedges. There may be a strong bryophyte component, usually dominated by sphagnum moss (*Sphagnum* spp.).

According to the Pennsylvania Natural Heritage Program's (PNHP) Pennsylvania Conservation Explorer online system, DCNR identified an expansive Palustrine Hemlock Forest community that begins [redacted] before transitioning to maintained lawn and open fields approximately 650 feet upstream of US 322.

5.0 Methods

The botanical field survey was conducted by Skelly & Loy environmental scientists on nine separate site visits (April 17-18; April 21-25; and May 6-7, 2025) and by walking across potential habitat areas within the EIS project area and preliminary limit of disturbance area buffers. Environmental scientists documented plant species present within potential habitat areas, while specifically searching for the target species of concern using illustrative keys, field guides, and dichotomous keys for plant species verification. The potential habitat areas within the EIS project area were walked twice, in opposite directions, by at least two environmental scientists. In total, eight environmental scientists spent approximately 380 man-hours investigating the potential habitat present in the EIS project area. All survey events were conducted during the flowering period of *Amelanchier sanguinea, Carex formosa,* and *Trillium flexipes*.

Prior to the field survey effort, potential habitat areas were identified based on a desktop review utilizing aerial imagery to identify forested and shrub-dominated habitat types that met habitat characteristics to support the target species of concern. Particular attention was paid to potential habitat types including forested slopes, remnant woods, wide hedgerows, floodplain and riparian areas, and palustrine scrub-shrub (PSS) / palustrine forested (PFO) wetlands. Land uses and habitat types excluded from the desktop review and field survey effort included agricultural fields and tree farms, maintained lawns and golf courses, developed residential and commercial properties, narrow (single-tree) hedgerows and fence lines, and palustrine emergent (PEM) wetland complexes.

Based on the desktop review, approximately eighty-four (84) properties encompassing a total of 1,379 acres were identified as containing potential habitat to be surveyed for the target species of concern, and occurrences of Hemlock Palustrine Forest. Of the total 1,379 acres surveyed, 410 acres consisted of forest habitat. An additional nine parcels that may contain potential habitat areas, were not surveyed due to restricted property access.

6.0 Results and Discussion

On April 17 & 18, 2025, the weather conditions were sunny with temperatures ranging from a low of 37°F to a high of 75°F. No precipitation fell across the region in the 48 hours prior to the April 17 & 18th field survey (Weather Underground, 2025). During the field events that occurred within April 21 to 25, 2025, weather conditions ranged from cloudy to partly sunny with temperatures ranging from a low of 43°F to a high of 81°F. No precipitation fell across the region in the 48 hours prior to or during this week-long survey event (Weather Underground, 2025). On May 6 & 7, 2025, the weather conditions ranged from being foggy to partly sunny with temperatures ranging from a low of 45°F to a high of 70°F. No precipitation fell across the region in the 48 hours prior to the May 6 & 7th field surveys (Weather Underground, 2025). The closest weather station to the project area was at the State College Regional Airport Station located in State College, Pennsylvania, approximately 9.9 miles north of the project area.

The dominant land uses within the project area were US 322, PA 45, paved local roads, rural residential and commercial properties, farm operations, agricultural fields, wetland complexes, forested slopes, remnant woods, hedgerows, and riparian corridors. Representative photographs of the project corridor are provided in **Appendix C**.

The potential habitat within the project area for the target species of concern included forested slopes and thickets for Roundleaf Serviceberry (*Amelanchier sanguinea*), and wooded slopes and floodplains for Declined Trillium (*Trillium flexipes*) and Handsome Sedge (*Carex formosa*). The potential habitats types and vegetative communities present are described below. A comprehensive plant list of the species identified in each habitat type is provided in **Appendix D**.

Continuous Forest & Forested Slopes

This habitat type consisted of continuous tracts of forested land on the lower mountain slopes along the southern extent of the project area. These mid-successional, second growth, mixed hardwood forest communities were dominated by oak and hickory and were conducive to slightly acidic soil conditions, which differ from the soil conditions throughout the open valley where the majority of the project area is situated. The continuous forest and forested slope habitat areas are underlain by primarily shale, sandstone, and some limestone which differs from the limestone-dominant geology in the open valley where majority of the project area is situated. Additionally, oak and hickory-dominated forests tend to thrive in slightly acidic soil conditions due to a combination of biological, chemical, and ecological factors that reinforce and maintain this soil profile and condition overtime. Oak leaves are rich in tannins and other organic acids. When they fall and decompose, they release these compounds into the soil, lowering the pH. Also, oak leaf litter decomposes more slowly than that of many other trees, which prolongs the release of organic acids and maintains slightly acidic soil conditions. Slightly acidic soil conditions would not likely be conducive to the three target species of concern. No calcareous soil characteristics or conditions were observed within the continuous forest and forested slope habitat areas present within the project area.

The forest understory and floor communities were dominated by invasive species, and the establishment of these three target species is unlikely. The dominant tree species in present in the canopy overstory communities included Red Maple (*Acer rubrum*), Shagbark Hickory (*Carya ovata*), American Beech (*Fagus grandifolia*), White Pine (*Pinus strobus*), Bigtooth Aspen (*Populus grandidentata*), Black Cherry (*Prunus serotina*), Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Chestnut Oak (*Quercus montana*), and Eastern Hemlock (*Tsuga canadensis*). The understory was largely open with scattered patches of shrubs and small trees consisting of Japanese Barberry (*Berberis thunbergii*), American Witchhazel (*Hamamelis virginiana*), European Privet (*Ligustrum vulgare*), Morrow's Honeysuckle (*Lonicera morrowii*), Multiflora Rose (*Rosa multiflora*), Tall Deerberry (*Vaccinium stamineum*), and Blue Ridge Blueberry (*Vaccinium pallidum*). The forest floor communities were relatively sparse due to the closed canopy conditions. The common herbaceous species encountered included Garlic Mustard (*Alliaria petiolata*), Meadow Garlic (*Allium canadense*), Wild Garlic (*Allium vineale*), Stripped Wintergreen (*Chimaphila maculata*), Princess Pine (*Dendrolycopodium obscurum*), Eastern Hayscented Fern (*Dennstaedtia punctilobula*), Marginal Woodfern (*Dryopteris marginalis*), Intermediate Woodfern (*Dryopteris intermedia*), and Japanese Stiltgrass (*Microstegium vimineum*). Vine species present included Oriental Bittersweet (*Celastrus orbiculatus*), Virginia Creeper (*Parthenocissus quinquefolia*), Roundleaf Greenbriar (*Smilax rotundifolia*), Eastern Poison Ivy (*Toxicodendron radicans*), and Fox Grape (*Vitis labrusca*).

Remanent Woods

This habitat type consisted of forest fragments located on ground that would not have been historically suitable for agricultural land use due to shallow or rocky soils, wet soils, and steep slopes. Remanent forest patches were also positioned in property boundary corners where hedgerows converge. These isolated patches of forest are often bordered on all sides by agricultural land, rural residential or commercial properties, and/or local roads. [redacted]. Within the project area, the remanent woods habitat consisted of dry to mesic, mid-successional, second-growth forests dominated by dense thickets of invasive shrub species in the understory community, which makes the establishment of the target species is unlikely.

The dominant tree species present in the canopy/overstory communities included Yellow Birch (*Betula alleghaniensis*), Pignut Hickory (*Carya glabra*), Green Ash (*Fraxinus pennsylvanica*), White Ash (*Fraxinus americana*), American Hophornbeam (*Ostrya virginiana*), Norway Spruce (*Picea abies*), White Pine (*Pinus strobus*), Black Cherry (*Prunus*

serotina), Black Locust (*Robinia pseudoacacia*), and Common Hackberry (*Celtis occidentalis*). The dominant shrub and small tree species in the understory communities included Japanese Barberry (*Berberis thunbergii*), Autumn Olive (*Elaeagnus umbellata*), Forsythia (*Forsythia spp.*), European Privet (*Ligustrum vulgare*), Morrow's Honeysuckle (*Lonicera morrowii*), Tatarian Honeysuckle (*Lonicera tatarica*), Multifloral Rose (*Rosa multiflora*), Black Raspberry (*Rubus occidentalis*), and Allegheny Blackberry (*Rubus allegheniensis*). The dominant herbaceous plant species present in the understory forest floor community included Garlic Mustard (*Alliaria petiolata*), Meadow Garlic (*Allium canadense*), Wild Garlic (*Allium vineale*), Lesser Burdock (*Arctium minus*), Common Wormwood (*Artemisia vulgaris*), Hairy Bittercress (*Cardamine hirsuta*), Pennsylvania Sedge (*Carex pensylvanica*), Ground Ivy (*Glechoma hederacea*), Dame's Rocket (*Hesperis matronalis*), and Japanese Stiltgrass (*Microstegium vimineum*). Dominant vine species present included Oriental Bittersweet (*Celastrus orbiculatus*), Virginia Creeper (*Parthenocissus quinquefolia*), and Eastern Poison Ivy (*Toxicodendron radicans*).

Hedgerows

This habitat type was common throughout the project area and consisted of dense linear strips of trees, shrubs, and undergrowth forming natural borders that separated agricultural fields and demarcated property boundaries. [redacted]. Within the project area, most hedgerow habitat consisted of dry to mesic, early to mid-successional, second-growth forests dominated by dense thickets of invasive shrub species in the understory community, which makes the establishment of the target species is unlikely.

The dominant tree species present in the canopy/overstory communities included Boxelder (Acer negundo), Norway Maple (*Acer platanoides*), Red Maple (*Acer rubrum*), Yellow Birch (*Betula alleghaniensis*), Honey Locust (*Gleditsia triacanthos*), Black Walnut (*Juglans nigra*), Norway Spruce (*Picea abies*), and Black Locust (*Robinia pseudoacacia*). The dominant shrub and small tree species in the understory communities included Autumn Olive (*Elaeagnus umbellata*), Forsythia (*Forsythia spp.*), European Privet (*Ligustrum vulgare*), Morrow's Honeysuckle (*Lonicera morrowii*), Tatarian Honeysuckle (*Lonicera tatarica*), Multifloral Rose (*Rosa multiflora*), Black Raspberry (*Rubus occidentalis*), and Allegheny Blackberry (*Rubus allegheniensis*). The dominant herbaceous plant species present in the understory floor community included Garlic Mustard (*Alliaria petiolata*), Wild Garlic (*Allium vineale*), Lesser Burdock (*Arctium minus*), Common Wormwood (*Artemisia vulgaris*), Bull Thistle (*Cirsium vulgare*), Fuller's Teasel (*Dipsacus fullonum*), Ground Ivy (*Glechoma hederacea*), Dame's Rocket (*Hesperis matronalis*), and Japanese Stiltgrass (*Microstegium vimineum*). Dominant vine species present included Oriental Bittersweet (*Celastrus orbiculatus*), Japanese Honeysuckle (*Lonicera japonica*), Eastern Poison Ivy (*Toxicodendron radicans*), and Fox Grape (*Vitis labrusca*).

Forested Floodplains & Riparian Areas

Forested floodplain and riparian habitat areas were less common throughout the project area, given that most of the floodplain and riparian corridors along the project area's streams exist as agricultural fields, fallow fields, and emergent wetland complexes. Forested floodplain and riparian habitat areas were present along sections of Spring Creek, Gailbraith Gap Run, Sleepy Creek, and Sinking Creek. [redacted]. The forested floodplain and riparian communities consisted of dry to mesic, mid-successional, second

growth mixed hardwood forests dominated by maples and ash. The understory communities consisted of shrub thickets, which were dominated by both native and invasive shrub species. These dense shrub thickets present in the riparian areas make the establishment of the three target species unlikely.

The dominant tree species present in the overstory/canopy communities include Boxelder (*Acer negundo*), Red Maple (*Acer rubrum*), Silver Maple (*Acer saccharum*), Hawthorn (*Crataegus spp.*), White Ash (*Fraxinus americana*), Black Walnut (*Juglans nigra*), Quaking Aspen (*Populus tremuloides*), and Eastern White Cedar (*Thuja occidentalis*). The dominant shrub and small tree species included Gray Alder (*Alnus incana*), Gray Dogwood (*Cornus racemosa*), Autumn Olive (*Elaeagnus umbellata*), European Privet (*Ligustrum vulgare*), Morrow's Honeysuckle (*Lonicera morrowii*), Tatarian Honeysuckle (*Lonicera tatarica*), Multifloral Rose (*Rosa multiflora*), Black Raspberry (*Rubus occidentalis*), Allegheny Blackberry (*Rubus allegheniensis*), and Black Elderberry (*Sambucus nigra*). The dominant herbaceous plant species present included Garlic Mustard (*Alliaria petiolata*), Meadow Garlic (*Allium canadense*), Lesser Burdock (*Arctium minus*), Common Wormwood (*Artemisia vulgaris*), Garden Yellowrocket (*Barbarea vulgaris*), Greater Celandine (*Chelidonium majus*), Fuller's Teasel (*Dipsacus fullonum*), Japanese Stiltgrass (*Microstegium vimineum*), Reed Canary Grass (*Phalaris arundinacea*), Goldenrods (*Solidago spp.*), and Stinging Nettle (*Urtica dioica*). Dominant Vine species present included Oriental Bittersweet (*Celastrus orbiculatus*), and Japanese Honeysuckle (*Lonicera japonica*).

PSS & PFO Wetlands

Within the project area, [redacted] that may have been suitable to support the target species; however, establishment of these target species is unlikely due to saturated soil conditions and the abundance of dense shrub thickets.

The dominant tree species present included Boxelder (Acer negundo), Red Maple (*Acer rubrum*), Silver Maple (*Acer saccharum*), Green Ash (*Fraxinus pennsylvanica*), and Slippery Elm (*Ulmus rubra*). Dominant shrub species present included Gray Alder (*Alnus incana*), Silky Dogwood (*Cornus amomum*), Gray Dogwood (*Cornus racemosa*), European Privet (*Ligustrum vulgare*), Tatarian Honeysuckle (*Lonicera tatarica*), Multiflora Rose (*Rosa multiflora*), Black Willow (*Salix nigra*), and Southern Arrowwood (*Vibrunum dentatum*). Dominant herbaceous species present included Harvestlice (*Agrimonia parvifolia*), Devil's Beggartick (*Bidens frondosa*), Fringed Sedge (*Carex crinita*), Shallow Sedge (*Carex lurida*), Broom Sedge (*Carex scoparia*), Poison Hemlock (*Conium maculatum*), Purpleleaf Willowherb (*Epilobium coloratum*), Soft Rush (*Juncus effusus*), Rice Cutgrass (*Leersia oryzoides*), Japanese Stiltgrass (*Microstegium vimineum*), Reed Canary Grass (*Phalaris arundinacea*), and Narrowleaf Cattail (*Typha angustifolia*).

7.0 Species of Concern Identified

An occurrence of Goldenseal (*Hydrastis canadensis*) was identified within the project area. Goldenseal is a state-listed vulnerable species. Vulnerable species are plant species which are in danger of population decline within the Commonwealth of Pennsylvania because of their beauty, economic value, use as a cultivar, or other factors which indicate that persons may seek to remove these species from their native habitats.

The identified population of Goldenseal [redacted]. Approximately 100 individual plants were noted within [redacted] in the project area. Photographs of the identified vulnerable species are provided in **Appendix C.** Botanical field survey forms documenting these identified population is provided in **Appendix E**.

No occurrences of *Amelanchier sanguinea*, *Carex formosa*, or *Trillium flexipes* were identified within the project area. Suitable habitat for all three (3) target species of concern exists within the project area; however, no occurrences of these species were observed during the botanical survey. The majority of the project area consists of rural commercial and residential properties, farm operations, agricultural fields, and paved roadways. The forest remnants and hedgerows throughout the project area were dominated by invasive shrub species, and establishment of these three target species is unlikely. The forested habitat consisting of continuous tracts of forested land on the lower mountain slopes along the southern extent of the project area, contained forest communities that are conductive to slightly acidic soil conditions which differ from soil conditions through the open valley where the majority of the project area is situated. The habitat characteristics for all three target species made note of calcareous soil conditions as a defining habitat characteristic. Between the soil conditions and the presence of invasive species in the understory communities, the establishment of the three target species is unlikely in the tracts of continuous forest. A comprehensive plant list of the species identified in each habitat type is provided in **Appendix D**.

7.1 Natural Communities of Concern within the Project Area

The project area contains approximately [redacted] previously identified by DCNR as special concern resource. However, the botanical survey field effort was not able to field confirm the [redacted] community composition [redacted]. The wetland and watercourse delineation field investigation conducted in 2023 identified [redacted] wetland complex features.

8.0 Conclusions and Recommendations

Species of Concern

Based on botanical survey field investigations conducted by Skelly and Loy in April and May 2024, no occurrences of the three target species of concern were identified within the project area. Given the dominance of invasive shrub, herbaceous, and vine species present in suitable habitat areas, the establishment of the three target species is unlikely within the project area (**Appendix D**). One occurrence of a non-target vulnerable species, Goldenseal, was documented within the project area (**Appendix E**).

Within the project area, suitable habitat for the three target species of concern included remanent woods, forested floodplains and riparian areas, and PSS/PFO, all with calcareous soil conditions. The project's alternatives and design development has taken into consideration the avoidance and minimization of impacts to natural resources including forests, wetlands, waterways, floodplains, and riparian areas, which serve as habitat for wildlife and diverse vegetative communities. The project designs incorporate numerous bridge crossings over the different stream valley locations in an effort to avoid and minimize impacts to the aquatic and riparian resources. The preliminary engineering and final design phases of the project will continue to evaluate measures to avoid and minimize impacts to natural resources.

Natural Communities of Concern

Based on the wetland and watercourse delineation field investigation conducted in 2023, [redacted] within the project area. [redacted] No additional occurrences of Palustrine Hemlock Forest communities were identified within the project area.

Based on aerial imagery and wetland delineation field observations, [redacted] the Hemlock Palustrine Forested identified by DCNR, will not be impacted by the project.

9.0 References

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10.0 List of Contributors

Samantha R. Hockenberry, PWS, CE, Senior Scientist
DCNR Wild Plant Management Permit No. 25-697
36-Hour Swamp School Wetland Delineation & Regional Supplement Training
24-Hour OSHA Hazardous Waste Operations and Emergency Response Training
30-Hour OSHA Construction Safety Training
PennDOT Phase I Bog Turtle Habitat Evaluation Training
Professional Wetland Scientist (PWS # 3059), Society of Wetland Scientists
Certified Ecologist (CE), Ecological Society of America
Certified Taxonomist (Aquatic Insects to Family Level), Society of Freshwater Science
Forest Conservation Qualified Professional (FCQP), Maryland Department of Natural Resources
Professional Experience: 12 years
Education: Bachelor of Science, Biology; Master of Science., Biology

Luke M. Gaidos, Staff Scientist
DCNR Wild Plant Management Permit No. 25-875
Graminoids Identification for Wetlands & Wetland Delineators Course, Wetland Training Institute
Wetland Identification & Delineation Survey Methods
Bog Turtle Habitat Survey & Assessment Methods
Botanical Identification & Survey Methods
Environmental Compliance Monitoring & Reporting
Professional Experience: 7 years
Education: Bachelor of Science, Biology

Emma J. Shuey, Field Scientist
Botanical Identification & Survey Methods
Benthic Macroinvertebrate Sampling Protocols & Methods (PA)
Water Quality and Surface Water Sampling Protocols & Methods (PA)
Wetland Identification & Delineation Survey Methods
Biological Evaluation & Assessment Methods
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Education: Bachelor of Science, Fish, Wildlife, and Conservation Biology

Samuel N. Williamson, Field Scientist
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Water Quality and Surface Water Sampling Protocols & Methods (PA)
Wetland Identification & Delineation Survey Methods
Biological Evaluation & Assessment Methods
Environmental Compliance Monitoring & Reporting
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Education: Bachelor of Science, Earth Sciences

Austin N. Eberly, Staff Scientist
MBSS Benthic Macroinvertebrate Field Sampling Certification, 2023
Wetland Identification & Delineation Survey Methods
Biological Evaluation & Assessment Methods
Bog Turtle Habitat Survey & Assessment Methods
Eastern Spadefoot Toad Habitat Survey & Assessment Methods
Botanical Identification & Survey Methods
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Wetland Identification & Delineation Survey Methods
Bog Turtle Habitat Survey & Assessment Methods
Environmental Compliance Monitoring & Reporting
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Megan J. Morris, Field Scientist
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Wetland Identification & Delineation Survey Methods
Biological Evaluation & Assessment Methods
Environmental Compliance Monitoring & Reporting
Professional Experience: 3 years
Education: Bachelor of Science, Biology

Elizabeth B. Grietzer, Staff Scientist
Botanical Identification & Survey Methods
Biological Evaluation & Assessment Methods
Bat Habitat Survey & Assessment Methods
Professional Experience: 9 years
Education: Bachelor of Science, Biology; Master of Science. Biology

Appendix A
PNDI Receipt & DCNR Letter

1. PROJECT INFORMATION

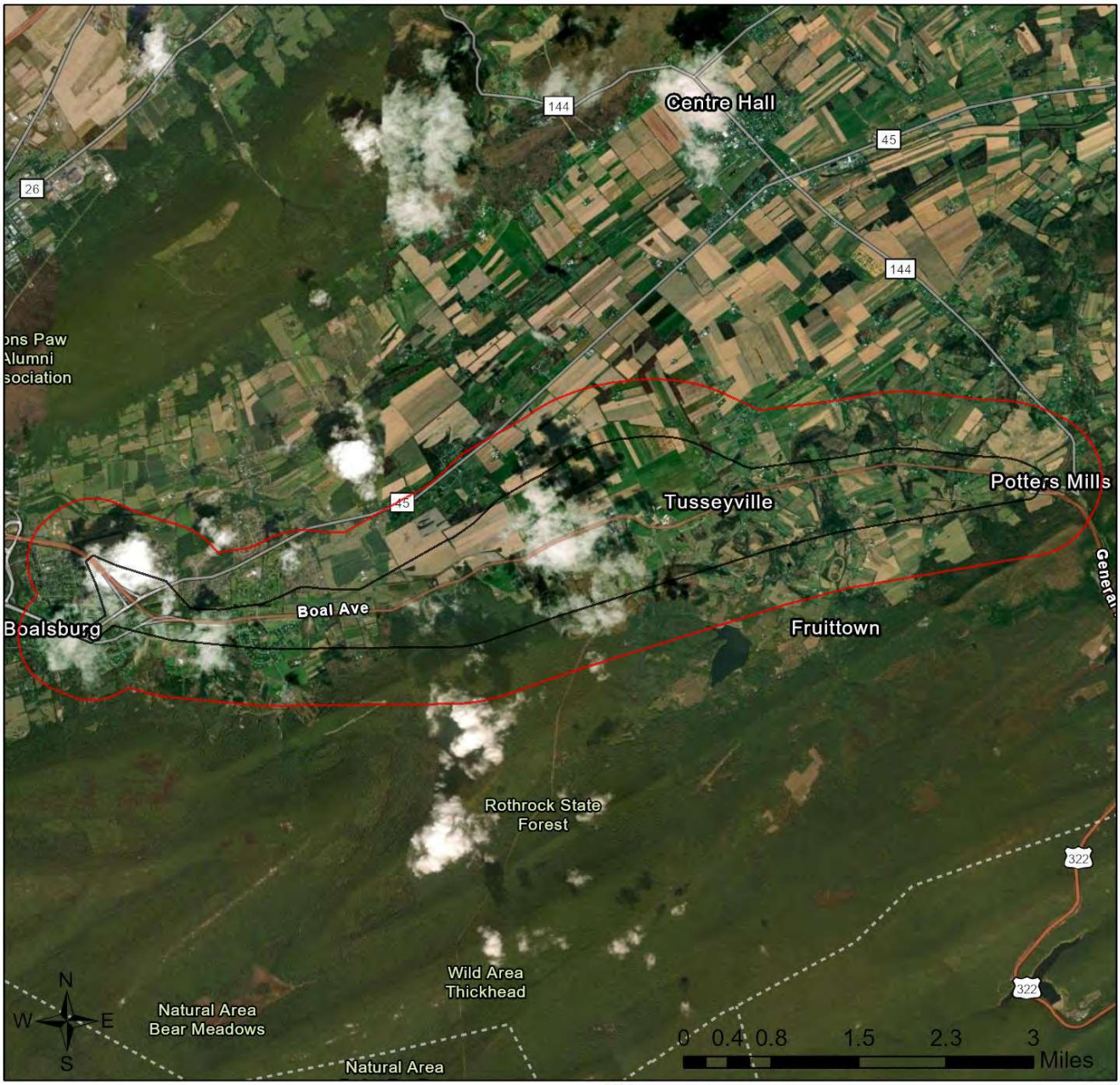
Project Name: **PennDOT_State College Connector Project - NEPA Study Area PNDI Re-Run**
Date of Review: **1/8/2025 05:14:01 PM**
Project Category: **Transportation, Roads, New construction/ New alignment**
Project Area: **3,963.37 acres**
County(s): **Centre**
Township/Municipality(s): **Harris Township; Potter Township**
ZIP Code:
Quadrangle Name(s): **CENTRE HALL; STATE COLLEGE**
Watersheds HUC 8: **Bald Eagle; Lower Susquehanna-Penns**
Watersheds HUC 12: **Cedar Run; Colyer Lake-Sinking Creek; Spring Creek-Bald Eagle Creek**
Decimal Degrees: **40.788598, -77.706353**
Degrees Minutes Seconds: **40° 47' 18.9510" N, 77° 42' 22.8706" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	**Conservation Measure**	**No Further Review Required, See Agency Comments**
PA Department of Conservation and Natural Resources	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	**Potential Impact**	**MORE INFORMATION REQUIRED, See Agency Response**

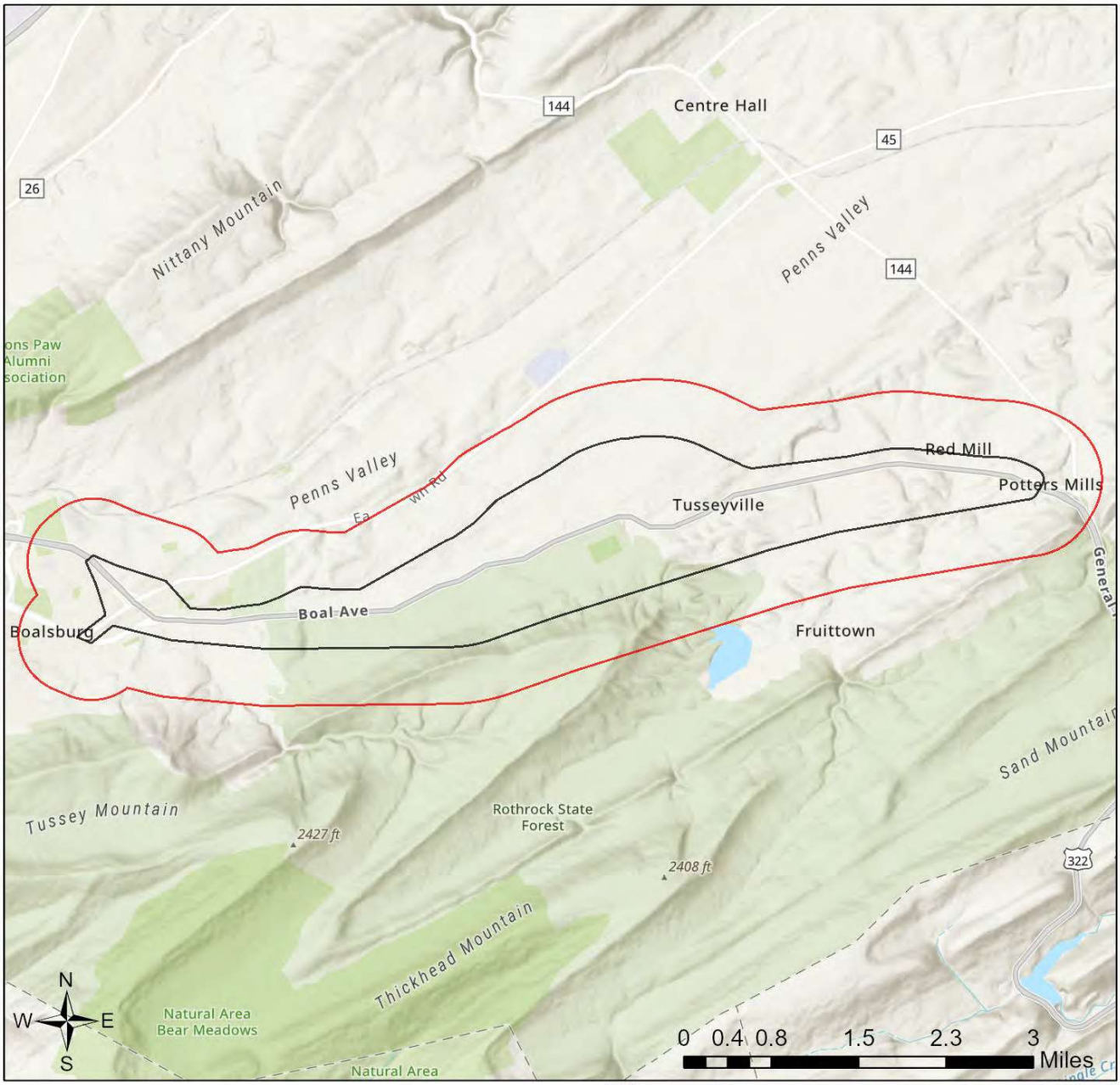
As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

PennDOT_State College Connector Project - NEPA Study Area PNDI Re-Run



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

PennDOT_State College Connector Project - NEPA Study Area PNDI Re-Run



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

RESPONSE TO QUESTION(S) ASKED

Q1: Does the following statement apply to this project? The project area HAS been investigated by someone qualified to identify and delineate wetlands, and wetlands or streams were located, and some project activities will or might occur within 300 feet of a wetland or stream.
Your answer is: Yes

Q2: Will the entire project area (including any discharge), plus a 300 feet buffer around the project area, all occur in or on an existing building, parking lot, driveway, road, road shoulder, street, runway, paved area, railroad bed, maintained (periodically mown) lawn, crop agriculture field or maintained orchard?
Your answer is: No

Q3: The proposed project is in the range of the Indiana bat. Describe how the project will affect bat habitat (forests, woodlots and trees) and indicate what measures will be taken in consideration of this. Round acreages up to the nearest acre (e.g., 0.2 acres = 1 acre).
Your answer is: The project will affect 40 to 200 acres of forests, woodlots and trees AND a seasonal restriction on tree clearing will be implemented (Conduct any tree cutting, tree inundation (flooding), and prescribed burning from October 1 to March 31.)

Q4: Is tree removal, tree cutting or forest clearing necessary to implement all aspects of this project?
Your answer is: Yes

Q5: Is tree removal, tree cutting or forest clearing of 40 acres or more necessary to implement all aspects of this project?
Your answer is: Yes

Q6: How many acres of woodland, forest, forested fencerows and trees will be cut, cleared, removed, disturbed or flooded (inundated) as a result of carrying out all aspects or phases of this project? [Round acreages UP to the nearest acre (e.g., 0.2 acres = 1 acre).]
Your answer is: More than 50 acres

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

Conservation Measure: Potential impacts to state and federally listed species which are under the jurisdiction of both the Pennsylvania Game Commission (PGC) and the U.S. Fish and Wildlife Service may occur as a result of this project. As a result, the PGC defers comments on potential impacts to federally listed species to the U.S. Fish and Wildlife Service. No further coordination with the Pennsylvania Game Commission is required at this time.

PA Department of Conservation and Natural Resources
RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

DCNR Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below. After desktop review, if a botanical survey is required by DCNR, we recommend the DCNR Botanical Survey Protocols, available here: https://conservationexplorer.dcnr.pa.gov/content/survey-protocols)

Scientific Name	Common Name	Current Status	Proposed Status	Survey Window
Hemlock Palustrine Forest	Hemlock Palustrine Forest	Special Concern Resource*	Special Concern Resource*	
Sensitive Species**		Special Concern Species*	Threatened	Flowers late April - early May

PA Fish and Boat Commission
RESPONSE:

Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)

Scientific Name	Common Name	Current Status
Alasmidonta undulata	Triangle Floater	Special Concern Species*

U.S. Fish and Wildlife Service
RESPONSE:

Information Request: The proposed project is located in the vicinity of northern long-eared bat spring staging/fall swarming habitat. Enter project information, including the Pennsylvania Natural Diversity Inventory receipt number, into the U.S. Fish and Wildlife Service's Information for Planning and Consultation tool (IPaC) (https://ecos.fws.gov/ipac/). Follow the Northern Long-eared Bat Rangewide Determination Key step-by-step process to review this projects's potential effect on northern long-eared bats.

Avoidance Measure: Conduct any tree cutting, disturbance, inundation (flooding) and prescribed burning from October 1 to March 31.

As the project proponent or applicant, I certify that I will implement the above Avoidance Measure:
_____(Signature)

SPECIAL NOTE: **If you agree to implement the above Avoidance Measure and if applicable, any Information Requests, no further coordination with this agency regarding threatened and endangered species and/or special concern species and resources is required.** If you are not able to comply with the Avoidance Measures, you are required to coordinate with this agency - please send project information to this agency for review (see "What to Send" section).

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email the following information to the agency(s) (see AGENCY CONTACT INFORMATION). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies (but not USFWS).
*If information was requested by USFWS, applicants must email, or mail, project information to IR1_ESPenn@fws.gov to initiate a review. USFWS will not accept uploaded project materials.

Check-list of Minimum Materials to be submitted:
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
In addition to the materials listed above, USFWS REQUIRES the following
____**SIGNED** copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
Email: IR1_ESPenn@fws.gov
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Management
Division of Environmental Review
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name:_____
Company/Business Name:_____
Address:_____
City, State, Zip:_____
Phone:(_____)_____Fax:(_____)_____
Email:_____

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

_____ _____
applicant/project proponent signature date

Pennsylvania
Department of Conservation and Natural Resources

1/10/2025

PNDI Number: PNDI-782938
Version: FINAL_1; 01/08/2025

James A. Sinclair
Skelly and Loy, Inc.
449 Eisenhower Boulevard, Suite 300
Harrisburg, PA 17111
Email: jsinclair@skellyloy.com (hard copy will not follow)

Re: PennDOT_State College Connector Project - NEPA Study Area PNDI Re-Run
Harris Township, Potter Township, Centre County, PA

Dear James A. Sinclair,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **PNDI-782938 (FINAL_1)** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

Potential Impact Anticipated – Survey Request

PNDI records indicate species or resources under DCNR's jurisdiction are located in the project vicinity. Based on a detailed PNDI review, DCNR determined potential impacts to the following threatened, endangered, or special concern species.

Scientific Name	Common Name	PA Current Status	PA Proposed Status	Survey Window	Suitable Habitat	Local Habitat
Hemlock Palustrine Forest	Hemlock Palustrine Forest	Special Concern Resource	Special Concern Resources			
Amelanchier sanguinea	Roundleaf Serviceberry	Special Concern Species	Endangered	Flowers mid-April - late May; fruits June - early July	Open woods, rocky slopes and barrens.	Deciduous shrub community on limestone.
Carex formosa	Handsome Sedge	Endangered	Endangered	Flowers / fruits May - July	Dry woods.	Calcareous, dry wooded north facing slope and in moist woods on level ground at the base of the slope.
Trillium flexipes	Declined Trillium	Special Concern Species	Threatened	Flowers late April - early May	Wooded hillsides, swampy woods and floodplains.	A diverse calcareous forest remnant along Spring Creek, growing on a gentle slope above the floodplain, with rocky and very calcareous soil.

- ✓ **Survey Request:** A botanical survey for the above species should be conducted by a qualified botanist at the appropriate time of year. Please submit the resulting report to our office for review. Contact our office prior to the survey for detailed information about the species or for a list of qualified surveyors.
- ✓ **Your botanist should carefully review the new DCNR Botanical Survey Protocols available at https://conservationexplorer.dcnr.pa.gov/content/survey-protocols**. These protocols are recommended to ensure that all necessary information is collected and that survey reports are prepared properly. It is the expectation of DCNR that these protocols will be followed when conducting surveys for species under our jurisdiction.
- ✓ **DCNR recommends that a Wild Plant Management Permit be obtained before conducting botanical surveys for Threatened, Endangered, and Special Concern PA Plant Species.** Permit information and application can be found here: https://conservationexplorer.dcnr.pa.gov/content/resources
- ✓ **A list of qualified botanists who have obtained our Wild Plant Management Permit can be found at https://conservationexplorer.dcnr.pa.gov/content/wild-plant-management-permit-holders.** These botanists are suitable candidates to perform a survey to our scientific standards.
- ✓ All target and non-target state-listed species found during the botanical survey should be reported to our office. **Please submit a completed Botanical Field Survey Form for each occurrence or population identified: http://www.gis.dcnr.state.pa.us/PNDI/2015%20Field%20Survey%20Form.pdf**. Mitigation measures and monitoring may be requested if state-listed species are found on or adjacent to the site.
- ✓ If preferred habitat does not exist on site, a survey may not be necessary. Please submit a habitat assessment report which describes the current land cover, habitat types, and species found on site.

This response represents the most up-to-date review of the PNDI data files and is valid for two (2) years only. If project plans change or more information on listed or proposed species becomes available, our determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter and a permit has not been acquired, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative, description of project changes and accurate map). As a reminder, this finding applies to potential impacts under DCNR's jurisdiction only. Visit the PNHP website for directions on contacting the Commonwealth's other resource agencies for environmental review.

Should you have any questions or concerns, please contact Hope Brooks, Ecological Information Specialist, by phone (717-705-2819) or via email (c-hobrooks@pa.gov).

Sincerely,

Greg Podniesinski, Section Chief
Natural Heritage Section

Appendix B
Botanical Survey Mapping

Appendix C
Site Photographs

Photograph No. 1
(April 21, 2025)

View of hedgerow habitat located [redacted].
View was north.

Photograph No. 2
(April 21, 2025)

View within a section of wide hedgerow on a slope that was located [redacted]. View was northwest, [redacted]

Photograph No. 3
(April 21, 2025)

View of hedgerow habitat [redacted].
View was southwest.

Photograph No. 4
(April 18, 2025)

View of hedgerow habitat located [redacted]. This hedgerow continued uphill [redacted]. View was northwest.

Photograph No. 5
(April 18, 2025)

View of hedgerow habitat [redacted]. This hedgerow habitat primarily consisted of species including Tatarian Honeysuckle, Garlic Mustard, European Privet, Multifloral Rose, Black Locust, and Black Walnut. View was north.

Photograph No. 6
(April 18, 2025)

View of hedgerow habitat [redacted]. View was southeast [redacted].

Photograph No. 7
(April 17, 2025)

View of the outside edge of remnant forest habitat [redacted] View was northwest.

Photograph No. 8
(April 17, 2025)

View within the remnant forest habitat [redacted]. This portion of forest was filled with an overstory of Black Walnut, Green Ash, and White Ash, and a European Privet and Bush Honeysuckle understory. View was southeast.

Photograph No. 9
(April 17, 2025)

Another view of the remnant forest habitat [redacted]. Further within the forest, the habitat changes to include species like Norway Spruce, Canada Yew, English Ivy, Japanese Barberry. View was northwest.

Redact?

Photograph No. 10
(April 17, 2025)

View of remnant forest habitat [redacted]. View was south, [redacted].

Photograph No. 41
(April 17, 2025)

View of the remnant forest habitat [redacted]. This forest has a Red Maple, White Oak, Shagbark Hickory, and Black Walnut overstory with a Japanese Barberry and Japanese Honeysuckle shrub understory. View was west.

Photograph No. 52
(April 21, 2025)

View of remnant forest habitat [redacted]. View was northeast, [redacted].

Redact?

Photograph No. 16
(April 21, 2025)

View of the remnant forest habitat [redacted]. This forest was predominantly a Red Oak, Red Maple, White Oak, and Black Cherry canopy with Morrow's Honeysuckle, and a limited herbaceous understory. View was northeast.

Photograph No. 14
(May 7, 2025)

View of remnant forest habitat [redacted]
This portion of forest included species like Boxelder, Balsam Fir, Ironwood, and Red Oak. View was west.

Photograph No. 15
(May 7, 2025)

View of remnant forest habitat [redacted] This forest included species like Ironwood, Pin Oak, Black Cherry, White Fir, and Pignut Hickory. View was east.

Photograph No. 76
(April 22, 2025)

View of forested slope habitat [redacted]. This section of forest includes a canopy of Red Maple, Black Oak, White Oak, Pignut Hickory, and a shrub and fern understory. View was southeast.

Photograph No. 17
(April 22, 2025)

View of forested slope habitat [redacted]. This section of forest had a thick shrub understory of Japanese Barberry, Morrow's Honeysuckle, and Autumn Olive. Mountain Woodfern lined the herbaceous layer of the forest. View was south.

Photograph No. 18
(April 23, 2025)

View of sloped forested habitat [redacted]. This section of forest had a tall canopy of Shagbark Hickory, Black Birch, White Pine, and Pignut Hickory and was filled with thicker portions of Japanese Barberry and Morrow's Honeysuckle. View was west.

Photograph No. 89
(April 23, 2025)

View of sloped forested habitat [redacted] This section of forest begins with a shrub understory of Morrow's Honeysuckle and Japanese Barberry, and then thins out as elevation increases. View was south.

Photograph No. 20
(April 23, 2025)

View of [redacted] section of the sloped forested habitat in the picture above. This section of forest has a limited herbaceous layer, but has a canopy of Red Maple, Sugar Maple, Shagbark Hickory, Mockernut Hickory, and Chestnut Oak. View was south.

Photograph No. 21
(April 23, 2025)

View a section of sloped forested habitat [redacted]. This section includes species like Norway Spruce, Pitch Pine, and Striped Maple. View was south.

Photograph No. 22
(May 6, 2025)

View of sloped forested habitat [redacted] This section of forested slope changes into habitat with a lush herbaceous layer with Hay scented Fern, Rue Anemone, Common Blue Violet, White Avens, and Mayapple. View was northwest.

Photograph No. 23
(May 6, 2025)

View of a section of sloped forested habitat [redacted] that is predominantly composed of Sweet Birch with a limited understory of Rattlesnake Fern and Hay-scented Fern. View was west.

Photograph No. 24
(May 7, 2025)

View of a section of sloped forested habitat [redacted]. This habitat has a limited canopy layer with a rocky slope and calcareous soils. The understory was lined with species like White Pine, Yellow Pine, Highland Blueberry, New York Fern, Tall Deerberry, and White Snakeroot. View was west.

Photograph No. 25
(April 17, 2025)

View of a PSS wetland complex located [redacted]. This wetland was surrounded by a fringe buffer of trees and shrubs [redacted]. View was southeast.

Photograph No. 26
(April 17, 2025)

View of the PSS wetland complex [redacted]. Species within this wetland complex include Crack Willow, Silky Dogwood, Autumn Olive, Fuller's Teasel, Oriental Bittersweet, and Black Willow. View was northwest.

Photograph No. 27
(April 17, 2025)

View of the forest buffer [redacted]. The edge of the wetland had species including Slippery Elm, Norway Spruce, Green Ash, and Boxelder. View was north.

Photograph No. 28
(April 22, 2025)

View of the PSS wetland complex [redacted]. Species within this wetland complex include Reed Canary Grass, Narrowleaf Cattail, Fuller's Teasel, and Japanese Barberry. View was northwest, looking towards US 322.

Photograph No. 29
(May 7, 2025)

View of the PEM/PFO wetland complex [redacted]
Species include Boxelder, Norway Spruce, Black Birch, Reed Canary Grass, and Fuller's Teasel.
View was west.

Photograph No. 30
(May 7, 2025)

View of [redacted] the PEM/PFO wetland complex that is primarily composed of Reed Canary Grass, Silver Maple, Lesser Burdock, Queen Anne's Lace, and Fuller's Teasel.
View was east.

Redact?

Photograph No. 31
(April 24, 2025)

View of the singular population of 100 individual Goldenseal (*Hydrastis canadensis*) plants that were identified [redacted].

Photograph No. 32
(April 24, 2025)

View of a typical specimen identified as *Hydrastis* canadensis. This individual plant was located [redacted].
Note the unique stem and leaf arrangement that is a single, unbranched stem that bares leaves with serrated margins. The stem is typically purple with fine hairs.

Redact?

Photograph No. 33
(April 24, 2025)

View of the surrounding remnant forest habitat [redacted]d. The Goldenseal population was surrounded by species including Morrow's Honeysuckle, White Avens, Jack-in-the-Pulpit, Downy Yellow Violet, and Black Walnut.
View was northeast.

Appendix D
Botanical Survey
Plant Species List

Appendix D - Botanical Survey Plant Species List

Botanical Survey Plant List			Surveyed Habitat Types				
Scientific Name	Common Name	Wetland Indicator	Forested Slopes	Remanent Woods	Hedgerows	Floodplains & Riparian Areas	Wetlands (PSS/PFO)
			"X" = Presence "-" = Absence				
Tree Species							
Abies balsamea	Balsam Fir	FAC	-	X	-	-	-
Abies concolor	White Fir	NL	-	X	-	-	-
Acer negundo	Boxelder	FAC	X	-	X	X	X
Acer platanoides	**Norway Maple**	**UPL**	-	-	X	X	-
Acer pensylvanicum	Striped Maple	FACU	X	-	-	-	-
Acer rubrum	Red Maple	FAC	X	-	X	X	X
Acer saccharum	Silver Maple	FACU	X	-	-	X	X
Betula alleghaniensis	Yellow Birch	FAC	X	X	X	-	-
Betula lenta	Sweet Birch	FACU	X	-	-	-	-
Betula nigra	River Birch	FACW	X	-	-	-	-
Betula papyrifera	Paper Birch	FACU	X	-	-	X	X
Carya cordiformis	Bitternut Hickory	FACU	-	-	-	X	-
Carya glabra	Pignut Hickory	FACU	X	X	-	X	X
Carya ovata	Shagbark Hickory	FACU	X	-	-	X	X
Carya tomentosa	Mockernut Hickory	NL	X	-	-	-	-
Castanea dentata x mollissima	American Chestnut (Hybrid)	NL	X	-	-	-	-
Celtis occidentalis	Common Hackberry	FACU	-	X	-	X	-
Cornus florida	Flowering Dogwood	FACU	X	-	-	X	-
Crataegus crus-galli	Cockspur Hawthorn	FACU	X	-	-	X	X
Crataegus phaenopyrum	Washington Hawthorn	FAC	X	-	-	X	X
Fagus grandifolia	American Beech	FACU	X	-	-	-	-
Fraxinus americana	White Ash	FACU	X	X	-	X	-
Fraxinus pennsylvanica	Green Ash	FACW	X	X	-	-	X
Fraxinus sp.	Ash species	NL	X	-	-	-	-
Gleditsia triacanthos	Honey Locust	FAC	-	-	X	X	-
Juglans nigra	Black Walnut	FACU	X	-	X	X	X
Larix laricina	Tamarack	FACW	X	-	-	X	-
Liquidambar stryaciflua	Sweetgum	FAC	X	-	-	-	-
Liriodendron tulipifera	Tulip Poplar	FACU	-	X	-	-	-
Magnolia acuminata	Cucumber Tree	FACU	X	-	-	-	-

Appendix D - Botanical Survey Plant Species List

Botanical Survey Plant List			Surveyed Habitat Types				
Scientific Name	Common Name	Wetland Indicator	Forested Slopes	Remanent Woods	Hedgerows	Floodplains & Riparian Areas	Wetlands (PSS/PFO)
			"X" = Presence "-" = Absence				
Malus domestica	Common Apple Tree	NL	X	-	-	-	-
Malus spp.	Crabapple	NL	-	-	-	X	X
Morus rubra	Red Mulberry	FACU	X	-	-	-	-
Nyssa sylvatica	Blackgum	FAC	-	X	-	-	-
Ostrya virginiana	American Hophornbeam	FACU	X	X	-	-	-
Picea abies	**Norway Spruce**	**NL**	X	X	X	X	X
Picea pungens	Colorado Blue Spruce	FAC	-	X	X	X	-
Pinus echinata	Shortleaf Pine	NL	-	X	-	-	-
Pinus rigida	Pitch Pine	FACU	X	X	-	-	-
Pinus strobus	White Pine	FACU	X	X	X	X	-
Pinus sylvestris	Scotch Pine	NL	X	X	-	X	-
Pinus virginiana	Virginia Pine	NL	X	-	-	-	-
Populus grandidentata	Bigtooth Aspen	FACU	X	-	-	-	-
Populus tremula	European Aspen	FACU	-	-	X	-	-
Populus tremuloides	Quaking Aspen	FAC	-	-	-	X	-
Prunus avium	Sweet Cherry	UPL	-	-	-	X	-
Prunus cerasus	Sour Cherry	NL	-	-	-	X	X
Prunus serotina	Black Cherry	FACU	X	X	X	X	-
Prunus virginiana	Choke Cherry	FACU	X	-	-	X	-
Pyrus calleryana	**Callery Pear**	**NL**	-	-	X	X	X
Quercus alba	White Oak	FACU	X	-	X	X	-
Quercus montana	Chestnut Oak	UPL	X	X	-	-	-
Quercus palustris	Pin Oak	FACW	-	-	X	-	-
Quercus rubra	Red Oak	FACU	X	-	X	X	-
Quercus velutina	Black Oak	UPL	X	-	-	-	-
Robinia pseudoacacia	**Black Locust**	**FACU**	X	X	X	X	-
Salix babylonica	Weeping Willow	FACW	X	X	-	X	-
Salix fragilis	Crack Willow	FAC	-	-	-	-	X
Thuja occidentalis	Eastern White Cedar	FACW	-	X	X	-	-
Tilia americana	Basswood	FACU	X	-	-	X	-
Tsuga canadensis	Eastern Hemlock	FACU	X	-	X	X	-
Ulmus rubra	Slippery Elm	FAC	X	X	X	-	X

Appendix D - Botanical Survey Plant Species List

Botanical Survey Plant List			Surveyed Habitat Types				
Scientific Name	Common Name	Wetland Indicator	Forested Slopes	Remanent Woods	Hedgerows	Floodplains & Riparian Areas	Wetlands (PSS/PFO)
			"X" = Presence "-" = Absence				
Shrub Species							
Alnus incana	Gray Alder	FACU	-	-	-	X	X
Amelanchier arborea	Downy Serviceberry	FAC	X	X	-	-	-
Berberis thunbergii	**Japanese Barberry**	**FACU**	X	X	-	X	X
Cercis canadensis	Eastern Redbud	FACU	-	X	X	-	-
Cornus amomum	Silky Dogwood	FACW	X	-	-	-	X
Cornus drummondii	Roughleaf Dogwood	FAC	X	-	-	X	-
Cornus racemosa	Gray Dogwood	FAC	X	-	-	X	X
Corylus americana	American Hazelnut	FACU	-	-	-	X	-
Diervilla lonicera	Northern Bush Honeysuckle	NL	X	-	X	-	-
Elaeagnus angustifolia	**Russian Olive**	**FACU**	X	-	-	-	-
Elaeagnus umbellata	**Autumn Olive**	**FACU**	X	X	X	X	X
Euonymus alatus	**Burning Bush**	**NL**	-	-	-	X	-
Euonymus fortunei	**Winter Creeper**	**NL**	-	X	-	X	-
Forsythia spp.	**Forsythia**	**NL**	-	X	-	-	-
Hamamelis virginiana	American Witchhazel	FACU	X	-	-	-	-
Ligustrum vulgare	**European Privet**	**FACU**	X	X	X	X	X
Lonicera maackii	**Amur Honeysuckle**	**NL**	X	-	-	-	-
Lonicera morrowii	**Morrow's Honeysuckle**	**FACU**	X	X	X	X	X
Lonicera tatarica	**Tatarian Honeysuckle**	**FACU**	-	X	X	X	X
Rhamnus cathartica	**Common Buckthorn**	**FACU**	-	-	X	X	-
Rhododendron periclymenoides	Pink Azalea	FAC	X	-	-	-	-
Rhus typhina	Staghorn Sumac	NL	X	X	X	X	X
Ribes rotundifolium	Appalachian Gooseberry	NL	X	X	-	X	-
Rosa multiflora	**Multiflora Rose**	**FACU**	X	X	X	X	X
Rubus alleghnesiensis	Allegheny Blackberry	FACU	-	X	X	X	X
Rubus occidentalis	Black Raspberry	NL	X	X	X	X	X
Salix nigra	Black Willow	OBL	X	-	-	X	X
Sambucus nigra	**Black Elderberry**	**FAC**	-	-	-	X	-
Sambucus racemosa	Red Elderberry	FACU	X	-	-	-	-
Symphoricarpos orbiculatus	Coralberry	FACU	X	-	-	X	-
Taxus canadensis	Canada Yew	FAC	-	X	-	-	-
Vaccinium pallidum	Blue Ridge Blueberry	NL	X	-	-	-	-
Vaccinium stamineum	Tall Deerberry	FACU	X	-	-	-	-

Appendix D - Botanical Survey Plant Species List

Botanical Survey Plant List			Surveyed Habitat Types				
Scientific Name	Common Name	Wetland Indicator	Forested Slopes	Remanent Woods	Hedgerows	Floodplains & Riparian Areas	Wetlands (PSS/PFO)
			"X" = Presence "-" = Absence				
Vaccinium uliginosum	Alpine Blueberry	FAC	X	-	-	-	-
Vibrunum dentatum	Southern Arrowwood	FAC	X	X	-	-	X
Vibrunum lantana	Wayfaring Tree	NL	-	-	-	X	X
Viburnum prunifolium	Blackhaw	FACU	-	X	-	-	-
Herbaceous Species							
Achillea millefolium	Common Yarrow	FACU	X	X	-	-	-
Ageratina altissima	White Snakeroot	FACU	X	-	-	-	-
Agrimonia parviflora	Harvestlice	FACW	X	X	-	-	X
Alliaria petiolata	**Garlic Mustard**	**FACU**	X	X	X	X	X
Allium canadense	**Meadow Garlic**	**FACU**	-	X	-	X	-
Allium vineale	**Wild Garlic**	**FACU**	-	X	X	X	-
Andropogon virginicus	Broomsedge Bluestem	FACU	X	-	-	-	-
Antennaria plantaginifolia	Woman's Tobacco	NL	X	-	-	-	-
Apocynum androsaemifolium	Spreading Dogbane	FACU	-	-	X	-	-
Aquilegia canadensis	Red Columbine	FAC	X	-	-	-	-
Arctium minus	**Lesser Burdock**	**FACU**	X	X	X	X	-
Arisaema triphyllum	Jack in the Pulpit	FACW	-	X	-	-	-
Artemisia vulgaris	**Common Wormwood**	**UPL**	-	X	X	X	-
Asclepias syriaca	Common Milkweed	FACU	X	-	-	-	-
Barbarea vulgaris	**Garden Yellowrocket**	**FACU**	X	X	-	X	-
Bidens bipinnata	Spanish Needles	FACU	X	-	-	-	-
Bidens frondosa	Devil's Beggartick	FACW	X	-	-	-	X
Boehmeria cylindrica	Smallspike False Nettle	FACW	-	-	-	X	-
Botrypus virginianus	Rattlesnake Fern	FACU	X	-	-	-	-
Bromus inermis	**Smooth Brome Grass**	**UPL**	-	-	X	-	-
Cardamine hirsuta	Hairy Bittercress	FACU	X	X	-	X	-
Carex blanda	Eastern Woodland Sedge	FAC	X	X	-	-	-
Carex crinita	Fringed Sedge	OBL	X	-	-	-	X
Carex hirsutella	Fuzzy Wuzzy Sedge	NL	X	-	-	-	-
Carex lurida	Shallow Sedge	OBL	-	X	-	-	X
Carex pensylvanica	Pennsylvania Sedge	NL	X	X	-	X	-
Carex rosea	Rosy Sedge	FACU	-	-	-	-	-
Carex scoparia	Broom Sedge	FACW	-	-	-	-	X

Appendix D - Botanical Survey Plant Species List

Botanical Survey Plant List			Surveyed Habitat Types				
Scientific Name	Common Name	Wetland Indicator	Forested Slopes	Remanent Woods	Hedgerows	Floodplains & Riparian Areas	Wetlands (PSS/PFO)
			"X" = Presence "-" = Absence				
Caulophyllum thalictroides	Blue Cohosh	NL	-	X	-	-	-
Centaurea stoebe	**Spotted Knapweed**	**NL**	X	-	-	-	-
Chelidonium majus	**Greater Celandine**	**UPL**	-	X	X	X	-
Chimaphila maculata	Striped Wintergreen	NL	X	-	-	-	-
Circaea lutetiana	Broadleaf Enchanter's Nightshade	NL	X	-	-	-	-
Cirsium arvense	**Canada Thistle**	**FACU**	-	-	-	X	X
Cirsium vulgare	**Bull Thistle**	**FACU**	X	X	X	X	-
Claytonia virginica	Virginia Springbeauty	FAC	-	-	-	X	-
Clinopodium vulgare	Wild Basil	NL	-	-	-	X	-
Conium maculatum	**Poison Hemlock**	**FACW**	-	-	X	X	X
Convallaria majuscula	American Lily-of-the-Valley	NL	-	-	-	X	-
Cortaderia selloana	**Uruguayan Pampus Grass**	**FAC**	X	-	-	-	X
Cynoglossum officinale	**Gypsyflower**	**UPL**	-	X	-	-	-
Cyperus esculentus	Yellow Nutsedge	FACW	X	-	-	-	-
Dactylis glomerata	**Orchardgrass**	**FACU**	-	X	-	X	X
Daucus carota	**Queen Anne's Lace**	**UPL**	X	-	X	X	-
Dendrolycopodium obscurum	Princess Pine	FACU	X	-	-	-	-
Dennstaedtia punctilobula	Eastern Hayscented Fern	FACU	X	-	-	-	-
Dichanthelium clandestinum	Deer Tongue Grass	FAC	X	-	-	-	X
Dioscorea villosa	Wild Yam	FAC	X	-	-	-	-
Dipsacus fullonum	**Fuller's Teasel**	**FACU**	-	-	X	X	-
Dryopteris campyloptera	Mountain Woodfern	UPL	X	-	-	-	-
Dryopteris expansa	Spreading Woodfern	NL	X	-	-	-	-
Dryopteris intermedia	Intermediate Woodfern	FACU	X	X	-	X	-
Dryopteris marginalis	Marginal Woodfern	FACU	X	X	-	X	-
Duchesnea indica	Indian Strawberry	FACU	X	-	-	X	-
Echinochloa crus-galli	Barnyard Grass	FAC	-	X	X	-	X
Elymus virginicus	Virginia Wildrye	FACW	-	-	-	X	
Epilobium coloratum	Purpleleaf Willowherb	FACW	-	X	-	X	X
Equisetum arvense	Field Horsetail	FAC	-	-	-	X	
Erigeron annuus	Eastern Daisy Fleabane	FACU	-	X	-	X	-
Erythronium americanum	Dogtooth Violet	NL	-	X	-	-	-
Eurybia divaricata	White Wood Aster	NL	-	X	-	X	-

Appendix D - Botanical Survey Plant Species List

Botanical Survey Plant List			Surveyed Habitat Types				
Scientific Name	Common Name	Wetland Indicator	Forested Slopes	Remanent Woods	Hedgerows	Floodplains & Riparian Areas	Wetlands (PSS/PFO)
			"X" = Presence "-" = Absence				
Festuca spp.	Fescue Grasses	-	-	X	-	X	-
Fragaria vesca	Woodland Strawberry	FACU	-	-	-	X	-
Fragaria virginiana	Virginia Strawberry	FACU	-	X	-	X	-
Galium aparine	Sticky Willy	FACU	X	X	X	X	-
Galium circaezans	Wild Licorice	UPL	X	-	-	-	-
Galium hispidulum	Coastal Bedstraw	NL	X	-	-	-	-
Galium triflorum	Fragrant Bedstraw	FACU	X	X	-	-	-
Geranium maculatum	Spotted Geranium	FACU	-	-	X	-	-
Geranium molle	Dovefoot Geranium	NL	-	-	-	X	X
Geum aleppicum	Yellow Avens	FAC	-	-	X	-	-
Geum canadense	White Avens	FACU	X	X	X	X	-
Glechoma hederacea	**Ground Ivy**	**FACU**	X	X	X	X	-
Gnaphalium uliginosum	Marsh Cudweed	FAC	X	X	-	-	X
Hackelia virginiana	Virginia Stickseed	FACU	X	X	-	X	-
Hepatica nobilis	Roundlobe hepatica	NL	X	-	-	X	-
Hermerocallis lilioasphodelus	**Yellow Daylily**	NL	-	-	-	X	-
Hesperis matronalis	**Dames Rocket**	**FACU**	-	X	X	X	-
Houstonia caerulea	Azure Bluet	FACU	-	-	-	X	-
Hyacinthus orientalis	**Garden Hyacinth**	NL	X	-	-	-	-
Hydrastis canadensis	Goldenseal	NL	-	X	-	-	-
Impatiens capensis	Jewelweed	FACW	X	X	X	X	X
Iris pseudacorus	**Paleyellow Iris**	**OBL**	X	-	-	X	-
Juncus effusus	Soft Rush	FACW	X	X	-	X	X
Juncus tenuis	Poverty Rush	FAC	X	-	-	-	X
Lamiastrum galeobdolon	Yellow Archangel	NL	-	-	X	-	-
Lamium purpureum	Red Deadnettle	NL	-	X	X	X	-
Leersia oryzoides	Rice Cutgrass	OBL	-	X	-	X	X
Leucojum aestivum	**Summer Snowflake**	**NL**	-	-	-	X	-
Linaria vulgaris	**Yellow Toadflax**	**NL**	-	-	-	X	-
Lycopodium dendroideum	Prickly Tree-Clubmoss	FACU	X	-	-	-	-
Lycopodium obscurum	Rare Clubmoss	FACU	X	-	-	-	-
Lysimachia nummularia	**Creeping Jenny**	**FACW**	-	-	-	X	X
Lysimachia quadrifolia	Whorled Yellow Loosestrife	FACU	X	-	-	-	-

Appendix D - Botanical Survey Plant Species List

Botanical Survey Plant List			Surveyed Habitat Types				
Scientific Name	Common Name	Wetland Indicator	Forested Slopes	Remanent Woods	Hedgerows	Floodplains & Riparian Areas	Wetlands (PSS/PFO)
			"X" = Presence "-" = Absence				
Maianthemum canadense	Canada Mayflower	FAC	-	-	-	X	-
Mainanthemum racemosum	Feathery False Lily of the Valley	FACU	-	X	-	X	-
Microsteium vimineum	**Japanese Stiltgrass**	**FAC**	X	X	X	X	X
Mimulus ringens	Allegheny Monkeyflower	OBL	-	-	-	X	X
Miscanthus sinensis	**Chinese Silvergrass**	**FACU**	-	X	-	-	-
Mitchella repens	Partridgeberry	FACU	X	X	-	-	-
Monarda fistulosa	Wild Bergamot	UPL	-	X	-	X	-
Muscari armeniacum	Grape Hyacinth	NL	-	X	X	X	-
Myosotis scorpioides	**True Forget-Me-Not**	**OBL**	-	X	-	-	X
Narcissus poeticus	**Poet's Narcissus**	NL	X	-	-	-	-
Narcissus pseudonarcissus	**Wild Daffodil**	NL	X	X	X	-	-
Nepeta cataria	Catnip	FACU	X	X		-	-
Oenothera biennis	Common Evening Primrose	FACU	-	-	X	-	-
Onoclea sensibilis	Sensitive Fern	FACW	X	-	-	-	X
Osmunda cinnamomea	Cinnamon Fern	FACW	-	-	-	-	X
Oxalis stricta	Common Yellow Woodsorrel	FACU	-	X	X	-	-
Panicum spp.	Panicgrass	NL	-	-	X	-	-
Pastinaca sativa	**Wild Parsnip**	**NL**	-	-	-	-	X
Perilla frutescens	**Beefsteak Plant**	**FACU**	-	-	X	-	-
Phalaris arundinacea	**Reed Canary Grass**	**FACW**	X	X	-	X	X
Phytolacca americana	American Pokeweed	NL	X	-	X	X	-
Poa spp.	Meadow Grass Species	NL	-	X	-	X	-
Poa Pratensis	Kentucky Bluegrass	FACU	-	-	X	-	X
Podophyllum peltatum	Mayapple	FACU	X	X	X	X	-
Polygala paucifolia	Gaywings	FACU	X	-	-	-	-
Polygonatum biflorum	Smooth Solomon's Seal	FACU	X	-	-	X	-
Polygonatum pubescens	Hairy Solomon's Seal	FACU	X	-	-	X	-
Polygonum perfoliatum	**Asiatic Tearthumb**	**FAC**	X	-	-	-	-
Polygonum virginianum	Jumpseed	FAC	-	-	-	X	-
Polystichum acrostichoides	Christmas Fern	FACU	X	-	-	-	-
Potentilla simplex	Common Cinquefoil	FACU	X	-	X	X	-
Prenanthes alba	White Lettuce	FACU	X	-	-	-	-
Prenathes altissima	Tall Rattlesnake Root	FACU	X	-	-	-	-

Appendix D - Botanical Survey Plant Species List

Botanical Survey Plant List			Surveyed Habitat Types				
Scientific Name	Common Name	Wetland Indicator	Forested Slopes	Remanent Woods	Hedgerows	Floodplains & Riparian Areas	Wetlands (PSS/PFO)
			"X" = Presence "-" = Absence				
Prenanthes trifoliolata	Gall of the Earth	NL	X	-	-	-	-
Ranunculus abortivus	Littleleaf Buttercup	FACW	X	X	-	X	X
Ranunculus acris	Tall Buttercup	FAC	-	X	-	-	-
Ranunculus recurvatus	Blisterwort	FAC	-	X	-	-	-
Rubia peregrina	Common Wild Madder	NL	-	X	-	-	-
Rumex acetosella	**Common Sheep Sorrel**	**UPL**	X	-	-	-	-
Rumex crispus	Curly Dock	FAC	X	X	X	-	X
Rumex obtusifolius	Bitter Dock	FACU	-	-	-	X	-
Rumex spp.	Dock Species	NL	X	-	-	-	-
Sanguinaria canadensis	Bloodroot	UPL	-	-	-	X	-
Scilla siberica	Siberian Squill	NL	-	-	X	-	-
Scirpus cyperinus	Woolgrass	FACW	-	X	-	-	X
Scrophularia marilandica	Carpenter's Square	FACU	-	-	-	X	-
Securigera varia	**Crownvetch**	**NL**	-	X	X	X	-
Setaria viridis	Green Bristlegrass	NL	-	X	-	X	-
Solanum dulcamara	**Climbing Nightshade**	**FAC**	-	-	X	X	X
Solidago caesia	Wreath Goldenrod	FACU	X	-	-	-	-
Solidago rugosa	Wrinkleleaf Goldenrod	FAC	X	-	-	-	-
Solidago spp.	Goldenrod species	NL	-	-	X	X	X
Stellaria media	**Common Chickweed**	**UPL**	X	X	-	X	-
Stellaria pubera	Star Chickweed	NL	-	-	-	X	-
Symphyotrichum puniceum	Purplestem Aster	OBL	-	-	-	-	X
Symplocarpus foetidus	Skunk Cabbage	OBL	X	-	-	-	X
Taraxacum officinale	Common Dandelion	FACU	X	X	X	X	-
Thalictrum thalictroides	Rue Anemone	FACU	X	X	-	-	-
Thelypteris noveboracensis	New York Fern	FAC	X	-	-	-	X
Trifolium repens	White Clover	FACU	-	-	-	X	-
Tussilago farfara	**Coltsfoot**	**FACU**	-	X	-	-	-
Typha angustifolia	**Narrowleaf Cattail**	**OBL**	-	X	-	X	X
Urtica dioica	Stinging Nettle	FACU	X	-	X	X	-
Uvularia perfoliata	Perfoliate Bellwort	FACU	X	-	-	-	-
Verbascum thapsus	**Common Mullein**	**FACU**	X	X	X	-	X
Verbena hastata	Swamp Verbena	FACW	-	-	-	-	X

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Botanical Survey Plant List			Surveyed Habitat Types				
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			"X" = Presence "-" = Absence				
Verbesina alternifolia	Wingstem	FAC	-	-	X	-	-
Veronica arvensis	**Corn Speedwell**	**UPL**	-	X	-	-	-
Veronica hederifolia	**Ivy-leaved Speedwell**	NL	-	-	-	X	-
Viola papilionacea	Common Blue Violet	FAC	X	X	-	X	X
Viola pubescens	Downy Yellow Violet	FACU	X	-	-	-	-
Viola renifolia	White Violet	FACW	-	-	-	X	X
Viola sagittata	Arrowleaf Violet	FAC	X	-	-	-	-
Viola septentrionalis	Northern Woodland Violet	FACU	-	-	-	X	-
Viola sororia	Woolly Blue Violet	FAC	-	-	-	X	-
Zizia aurea	Golden Alexander	FAC	-	-	X	-	-
Vine Species							
Celastrus orbiculatus	**Oriental Bittersweet**	**FACU**	X	X	X	X	-
Hedera helix	**English Ivy**	**FACU**	-	X	-	X	-
Lonicera japonica	**Japanese Honeysuckle**	**FACU**	X	-	X	X	-
Parthenocissus quinquefolia	Virginia Creeper	FACU	X	X	-	X	-
Smilax rotundifolia	Roundleaf Greenbriar	FAC	X	-	-	-	-
Toxicodendron radicans	**Eastern Poison Ivy**	**FAC**	X	X	X	-	X
Vinca minor	**Common Periwinkle**	**NL**	X	-	-	X	-
Vitis aestivalis	Summer Grape	FACU	X	-	-	-	-
Vitis labrusca	Fox Grape	FACU	X	-	X	X	X
Vitis spp.	Grape Species	NL	-	-	-	X	-

Indicator Status Key:

NL - Non-Listed Plants - Plants that have not been classified for an indicator status.
OBL - Obligate Wetland Plants - Plants that occur almost always (estimated probability >99%) inwetlands under natural conditions, but which may also occur rarely (Estimated probability <1%) in nonwetlands.
FACW – Facultative Wetland Plants – Plants that occur usually (estimated probability >67% to 99%) in wetlands, but may also occur (estimated probability 1% to 33% in nonwetlands).
FAC – Facultative Wetland Plants – Plants that occur usually (estimated probability >34% to < 66%) in wetlands.
FACU – Facultative Upland Plants – Plants that occur sometimes (estimated probability 1% to <33%) in wetlands, but occur more often (estimated probability >67% to 99%) in nonwetlands.
UPL – Upland Plants – Plants that occur usually (estimated probability <1%) in wetlands, but occur almost always (estimated probability 99%) in nonwetlands.

Non-native species are listed in **bold font**.

Appendix E
Botanical Field Survey Form

BOTANICAL FIELD SURVEY FORM – PA PLANT SPECIES OF SPECIAL CONCERN

DCNR requests a Botanical Field Survey Form be submitted for each occurrence/population of a PA Plant Species of Special Concern (SOSC) found during a survey. Please attempt to complete as many fields as possible. Please direct any questions to DCNR Bureau of Forestry, Ecological Services Section at (717)-787-3444.

Species Name: Goldenseal (Hydrastis canadensis) PA Status: Vulnerable	**PNDI # (if applicable):** PNDI-782938 **EO ID # (if applicable):**	☐ **New Occurrence** ☐ **Update**
Surveyor(s): Luke Gaidos, Cooper Leslie, Samuel Williams	**Survey Date(s):** 4/24/2025	**Time Spent:** 2 hours
Site Name: State College Area Connector (SCAC) [redacted]	**GPS Coordinates of Occurrence (include datum):** [redacted] (NAD83 PA State Plane South)	
Directions to Site: [redacted]		
Site Owner: [redacted]	**Landowner aware of Species of Special Concern?** ☐ **YES** ■ **NO**	
Owner Contact Information: [redacted]	**Landowner interested in actively conserving SOSC?** ☐ **YES** ■ **NO** ☐ **UNKNOWN**	
	Additional Comments:	

General SOSC Habitat Description: [redacted]			
Estimate of Area of Potential Habitat: [redacted]			
Soil conditions (Substrate and soil type, soil moisture, underlying geology, etc.): 0-8 inches, 10YR 3/2 silt loam			
Relative age/Successional stage: Early to Mid Successional	**Aspect:** [redacted]	**Elevation (provide units):** [redacted]	
Moisture: ☐ **Inundated (hydric)** ☐ **Saturated (wet-mesic)** ☐ **Moist (mesic)** ■ **Dry (mesic)** ☐ **Dry (xeric)**	**Light:** ☐ **Open** ■ **Partial** ☐ **Filtered** ☐ **Shaded**	**Topo Position:** ☐ **Crest** ☐ **Upper Slope** ☐ **Mid-slope** ■ **Lower Slope** ☐ **Bottom**	**Slope:** ☐ **Flat** ■ **0-10%** ☐ **10-35%** ☐ **35+%** ☐ **Vertical**

SOSC Occurrence Information (describe below)

Phenology:	# Plants: Ramets[1]		Genets[2]	Population Area:	Age Structure:	Vigor:
■ In leaf	□	1-10	□	[redacted]	___ Annuals	□ Very Feeble
■ In bud	□	11-50	■		___ % Seedlings	□ Feeble
■ In flower	□	51-100	□		___ % Immature	□ Normal
□ Immature fruit	■	101-1000	□		___ % 1st Year	■ Vigorous
□ Mature fruit	□	1001-10K	□		100 % Mature	□ Exceptional vigor
□ Seed dispersing	□	10K+	□		___ % Senescent	
	200	EST #	50			

ID Confidence:
■ Positive ID □ Somewhat certain □ Uncertain

ID Problems (explain): N/A

X Known or X Inferred Land Use History:
[redacted]

Integrity/Fragmentation of Habitat:
[redacted]

Land Use/Disturbance Information:
[redacted]

Threats (on- or off-site):
Invasive encroachment; land development

Conservation or Management Recommendations:
Invasive species removal to prevent continued encroachment from surrounding shrubs. Leaf litter from surrounding overstory provides overwintering protection of the root system.

Additional SOSC Comments:
One population within an opening in the shrub layer and tree canopy.

[1]**Ramet: individual reproduced vegetatively (a clone)**
[2]**Genet: individual generated by sexual reproduction (a seedling)**

Associated Species :: Most Abundant/Dominant by Strata (est. % cover):

Canopy:	Sub-Canopy/Shrub:	Herbaceous:
70% when leaf out Black Walnut, White Ash, Pignut Hickory	65% Hawthorn, Amur & Morrow's Honeysuckles, Multiflora Rose	20% White Avens, Upland Sedge Species, Jack-in-the-Pulpit, Downy Yellow Violet

Other Species Present:

Canopy:	Sub-Canopy/Shrub:	Herbaceous:

Invasive Species Present at Site (est. % Cover):
Amur Honeysuckle - 15%; Multiflora Rose - 5%; Morrow's Honeysuckle - 45%

Please also submit site maps indicating species location, any photographs taken (to aid in confirming ID) and if a voucher specimen is collected, the label data, number, and repository.

Appendix F
DCNR Wild Plant Management Permits

pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

8100-FM-FROO33 Rev. 2/11

WILD PLANT MANAGEMENT PERMIT

Date: March 5, 2025 **Permit No.** 25-697

THIS PERMIT IS ISSUED TO:

Samantha Hockenberry for collection of Pennsylvania Endangered and Threatened plant species for submission as voucher specimens while conducting botanical studies and research in Pennsylvania.

THE PERMITTEE MUST CARRY THIS PERMIT DURING THE REMOVAL, COLLECTION, OR TRANSPLANTING OF PA ENDANGERED AND PA THREATENED PLANT SPECIES AND WILL PRESENT THIS PERMIT FOR INSPECTION UPON REQUEST. THE PERMITTEE MUST ALSO COMPLY WITH CHAPTER 45, SECTION 47 AND 48 RELATING TO REPORT INFORMATION.

PERMIT CONDITIONS:

Vouchers are to be deposited in an accredited institution. Notify land managers before conducting permitted activities. Permittee shall report results to the Bureau of Forestry, Ecological Services. Land owner permission must be acquired before conducting work.

Chris K Firestone

DCNR, BUREAU OF FORESTRY, WILD PLANT PROGRAM MANAGER

THIS PERMIT WILL EXPIRE **MARCH 5, 2026**

NONTRANSFERRABLE

THIS PERMIT MAY BE REVOKED FOR GOOD CAUSE.

pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

8100-FM-FROO33 Rev. 2/11

WILD PLANT MANAGEMENT PERMIT

Date: March 19, 2025 **Permit No.** 25-875

THIS PERMIT IS ISSUED TO:

Luke Gaidos for collection of Pennsylvania Endangered and Threatened plant species for submission as voucher specimens while conducting botanical studies and research in Pennsylvania.

THE PERMITTEE MUST CARRY THIS PERMIT DURING THE REMOVAL, COLLECTION, OR TRANSPLANTING OF PA ENDANGERED AND PA THREATENED PLANT SPECIES AND WILL PRESENT THIS PERMIT FOR INSPECTION UPON REQUEST. THE PERMITTEE MUST ALSO COMPLY WITH CHAPTER 45, SECTION 47 AND 48 RELATING TO REPORT INFORMATION.

PERMIT CONDITIONS:

Vouchers are to be deposited in an accredited institution. Notify land managers before conducting permitted activities. Permittee shall report results to the Bureau of Forestry, Ecological Services. Land owner permission must be acquired before conducting work.

Chris K Firestone

DCNR, BUREAU OF FORESTRY, WILD PLANT PROGRAM MANAGER

THIS PERMIT WILL EXPIRE **MARCH 19, 2026**

NONTRANSFERRABLE

THIS PERMIT MAY BE REVOKED FOR GOOD CAUSE.

PA Bureau of Forestry, Ecological Services Section
P.O. Box 8552, Harrisburg, PA 17105-8552 717-787-3444 (fax) 717-772-0271