

Pennsylvania Natural Heritage Program

ANNUAL REPORT 2025



MESSAGE FROM THE PROGRAM

As 2025 wound down, we found ourselves in a good place, remaining productive and positioned to take on new projects.

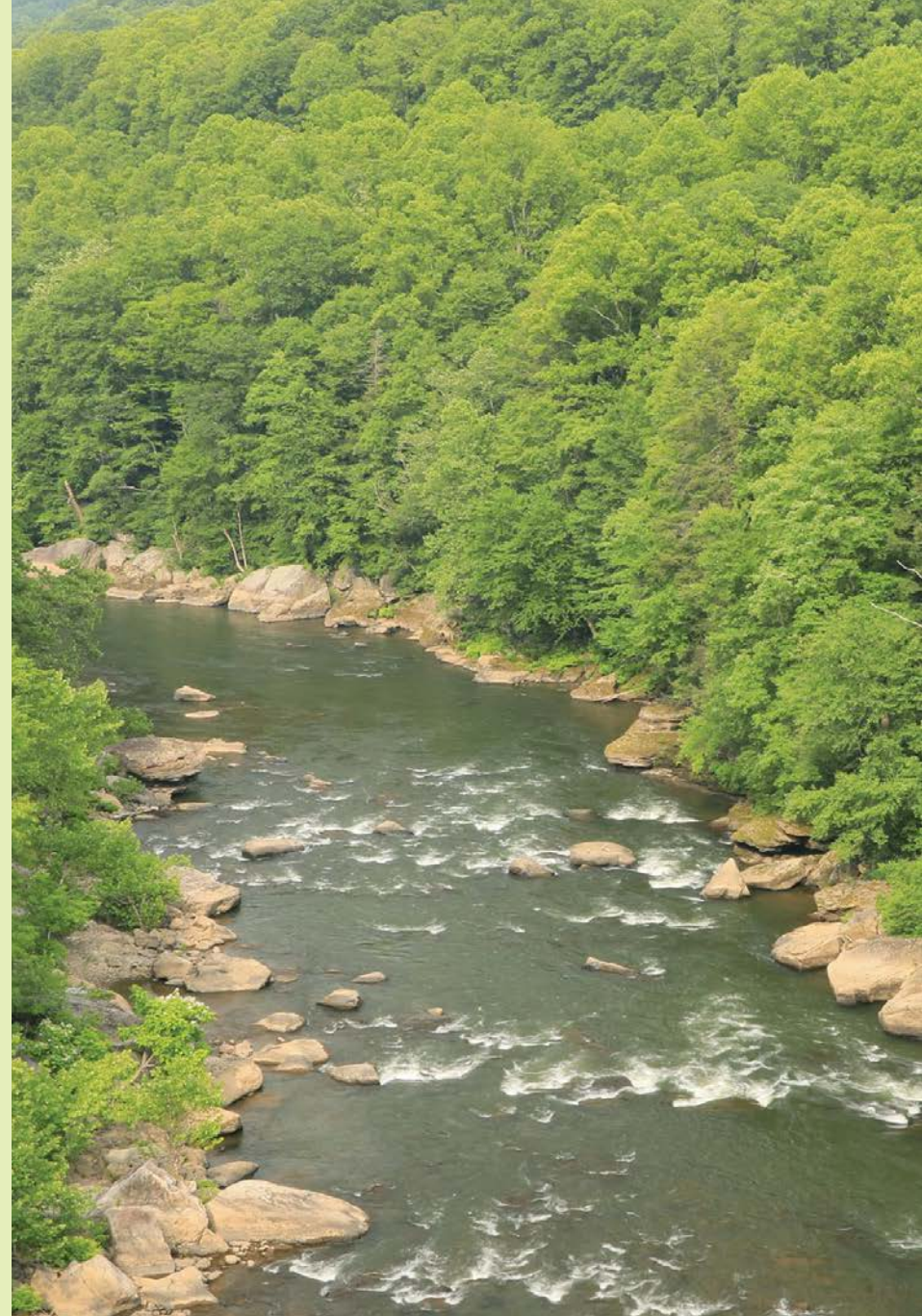
We continued to expand our taxonomic scope on several fronts. Our mycologist has assembled a list of fungi and lichens known to grow in Pennsylvania, our bryologist produced a new checklist of Pennsylvania mosses and liverworts, and our invertebrate zoologists made strides in understanding subterranean aquatic invertebrates. With a new MOU between our partners DCNR and PGC, we hope to turn more attention to terrestrial invertebrates; a huge group of our least known organisms.

Speaking of invertebrates, our PNHP partners, PGC and PFBC, are nearing the completion of the Pennsylvania Wildlife Action Plan (PA WAP) which assessed all of Pennsylvania's birds, mammals, herptiles, and nearly 1,500 of the state's aquatic and terrestrial invertebrates. The 2025 PA WAP was a monumental effort!

In 2025, we completed the field studies portion of a number of multi-year projects. Our wetlands plan project assessed numerous types of wetlands on DCNR land and compiled a substantial dataset that will be used in a variety of planning and management activities. Our old growth study developed a rapid assessment tool that can be used by DCNR, PGC, and foresters at large to manage or set aside forests that are old or moving toward old growth. The county inventory update for Adams, Franklin, Cumberland, and York counties will be completed in late spring of 2026. This effort yielded many new finds and will result in freshly mapped Natural Heritage Areas for planning applications.

We have always relied on collaboration and partnership, and this year was no different. Our freshwater mussel reintroduction projects in the West Branch of the Susquehanna River continued with help from the PFBC, Maryland DNR, State University of New York, and Trout Unlimited. We also partnered with Bird Lab to conduct surveys on two WPC properties as part of Monitoring Avian Productivity and Survivorship (MAPS), further documenting the breeding of Swainson's warbler at Bear Run Nature Reserve.

We are always busy with many projects – too many to cover within this report. However, we try to provide a cross section that shows the breadth of our work. Check out our website for even more insight into the work of PNHP.



OUR MISSION: *The Pennsylvania Natural Heritage Program provides scientific information, expertise, and assistance to support the conservation of biological diversity.*

PROGRAM STAFF & ROLES

The PNHP consists of staff from the DCNR Conservation Science and Ecological Resources Division, PFBC Biodiversity Section, PGC Wildlife Diversity Division and Habitat Planning and Development Division, and the Western Pennsylvania Conservancy Natural Heritage Program. WPC Natural Heritage Program staff work across all taxonomic groups and have primary responsibility for managing and providing information for PNHP tools and products. Partner agency staff provide support and guidance related to the conservation of their jurisdictional taxa. We collaborate on projects, leveraging capacity and often complementary expertise. Across the partnership, we collect, analyze, and provide data to effectively conserve the state's biodiversity.



DCNR, PGC, PFBC, WPC

The primary PNHP partners involved are indicated at the end of each project description.



PNHP is a member of NatureServe, an international network of state, provincial, and national natural heritage programs and conservation data centers. By developing tools, creating data standards, determining global species status ranks, consolidating data across the network, and providing numerous other network services, NatureServe offers a common point of contact and guidance for programs across the Americas. Our Conservation Explorer tool is an example of a NatureServe product tailored to PNHP use within Pennsylvania. Network programs serve on the U.S. Section Council (advisory body to NatureServe) and individual programs work together with NatureServe on numerous projects. PNHP, along with NatureServe and our international network of programs, work to share innovations and expertise to make each program stronger and more efficient.

Our projects and initiatives depend on the support of our partner organizations as well as funders from both the public and private sector. We would like to thank all of the program's funders and supporters for helping PNHP to be successful in meeting the biodiversity information needs of the state, region, and Natural Heritage Network.

Our Partners



In Cooperation With



SCIENCE

We approach each project as an opportunity to learn more about Pennsylvania's ecosystems and species, documenting new discoveries and population changes. We work across many different taxa – terrestrial and aquatic, vertebrate and invertebrate, and with many partners to collect critical biological information needed for conservation at all scales.



DISCOVERIES



A *Macropis* cuckoo bee (*Epeoloides pilosulus*)

RAREST BEE

This year PNHP biologists learned that they had collected an extremely rare bee in 2022. Sam Droege of the USGS Bee Inventory and Monitoring Lab identified a *Macropis* cuckoo bee (*Epeoloides pilosulus*) among bee specimens collected on a shale barren in Franklin County. This bee is a specialist nest parasite of several species of loosestrife oil bees in the genus *Macropis*, which are themselves rare pollen specialists on several species of loosestrife (*Lysimachia* spp.). Once feared extinct, and not seen in Pennsylvania since 1911, this bee has been found in several states in recent years. Sam describes this species as the poster child for rare bees in the eastern U.S. [WPC](#), [USFWS](#)

FOXTAIL CLUBMOSS

We found a new population of foxtail clubmoss (*Lycopodiella alopecuroides*) growing throughout an acidic seepage wetland on South Mountain. Interestingly, it was growing with two other clubmosses, one of which was previously documented from the site. Foxtail clubmoss is primarily a Coastal Plain species, making this find even more notable. [WPC](#), [DCNR](#)



Photo above: Foxtail clubmoss (left), southern bog clubmoss (middle), and northern bog clubmoss (right).

FOGG'S GOOSEFOOT

We increased known extant sites of the globally rare Fogg's goosefoot (*Chenopodium foggii*) from one to four this year, with discoveries of new sites by Brian Daggs, Scott Schuette, and iNaturalist user Koby Kilgore. This species is endemic to northeastern North America, and was described by Pennsylvania botanist H.A. Wahl in 1954. [WPC](#)



Fruits of Fogg's goosefoot as seen under a microscope

Dry ridge habitat of Fogg's goosefoot in central Pennsylvania



Green alder (*Alnus crispa*) found extant in PA in 2025.

GREEN ALDER

Green alder (*Alnus crispa*) is a Pennsylvania Endangered shrub of open uplands that ranges from Greenland to Canada, and southward to disjunct populations in Pennsylvania and North Carolina. Only two occurrences are known in Pennsylvania, and one was thought to be extirpated. In 2025, DCNR and WPC botanists revisited the apparently extirpated population, and worked with community scientist Mark Simonis to coordinate a visit to the other site. Mark found plants and collected vouchers and leaf material that will be included in a genetic study in collaboration with the University of North Carolina Asheville that will evaluate the relatedness of green alder occurrences in Pennsylvania and North Carolina. [WPC](#), [DCNR](#)



NUTTALL'S TICK-TREFOIL

PNHP staff found several patches of Nuttall's tick-trefoil (*Desmodium nuttallii*) in a grassland in Adams County, where it has never been documented before. We found it while surveying for other rare grassland specialists at the site including Scribner's panicgrass (*Dichanthelium scribnerianum*) and eastern smooth beardtongue (*Penstemon laevigatus*). **WPC**



GRASS-OF-PARNASSUS AND ITS BEE

In fall 2025, PNHP biologists visited a population of the Pennsylvania Endangered fen grass-of-Parnassus (*Parnassia glauca*) on the bluffs overlooking Lake Erie to look for the Parnassia miner bee (*Andrena parnassiae*). We found a population of the plant that was much larger than previously known, numbering well over ten thousand plants. We also found a healthy population of the bee, which had never been documented in Pennsylvania before. **WPC**



A first for Pennsylvania: Parnassia miner bee on its host plant, fen grass-of-Parnassus.



SLENDER SPIKERUSH

While looking for a rare *Carex* spotted by PNHP mammologists near one of their traps, a PNHP ecologist found a new population of an even rarer sedge, slender spikerush (*Eleocharis elliptica*). As a fen species, its occurrence in a wet diabase meadow was not a surprise, but finding it in Adams County was still unexpected: almost all of the known populations of this species in Pennsylvania are in the northwesternmost quarter of the state. **WPC, DCNR**

ZOOLOGY

YELLOW-CROWNED NIGHT HERONS THRIVE IN PENNSYLVANIA'S CAPITAL

The yellow-crowned night heron—one of Pennsylvania's rarest breeding birds—has once again made its mark in the capital city. Nesting in loose, single-species colonies, these striking, urban-adapted birds are thriving in Harrisburg, thanks to ongoing conservation efforts. Nest surveys in 2025 tallied a record-breaking 27 nests documented in Harrisburg—more than double the 10 nests recorded during the first Pennsylvania Bird Atlas (1983-1989). This marks the highest count ever recorded in the state! Local residents have played a key role in this success. Their growing interest in and protection of nearby nests is largely the result of consistent outreach and education by agency staff. [PGC](#)



All the components of rock vole habitat, except for the rock vole.

SEARCHING FOR THE TWO "ROCKS"

It's difficult to imagine conducting fieldwork from horseback or a Model T Ford, but that's just what Morris Green did in preparation for his volume *A Contribution to the Mammalogy of the North Mountain Region of Pennsylvania* (1930). Although we don't know the specifics of Green's survey efforts, his summary does report two significant contributions - the first documentation of both the long-tailed shrew (aka the rock shrew, *Sorex dispar*) and the rock vole (*Microtus chrotorrhinus*) in the state. As the common names suggest, both species inhabit rocky fields, usually with dense herbaceous vegetation, carpets of mosses, frequently with underground trickling water. As part of a Wild Resource Conservation Program (WRCP) funded project, PNHP zoologists have been searching for these little-known rocky mammals at historic sites including those near where Green captured them in the Roaring Twenties. While we've been successful at documenting rock shrew, so far, we have found no rock voles. While this effort has concluded, our results suggest more dedicated surveys are sorely needed for the little-known rock vole. [WPC](#), [DCNR](#), [PGC](#)

PLACED MUDPUPPY HABITAT ATTRACTS NUMEROUS SGCN

In June 2023, PNHP zoologists purchased and placed numerous large flat rocks to be used for mudpuppy habitat in four Western Pennsylvania waterways known to have mudpuppies. This was part of a WRCP grant to gauge the efficiency of attracting mudpuppies and (hopefully salamander mussels) to placed habitat. The mudpuppy is the only known host for the state endangered salamander mussel.

In August 2025, we gently lifted the rocks and checked to see if they attracted mudpuppies or salamander mussels. We discovered four species of greatest conservation need (SGCN) living under our placed rock habitats: mudpuppies, eastern hellbenders, rainbow mussels, and a federally endangered rayed bean mussel. Although no salamander mussels were observed during this check, it may have been too early for them to colonize the new habitat. This demonstrates that placed habitat in the right areas will attract and benefit numerous species, both rare and common. [WPC](#), [PFBC](#)

Malacologist Nevin Welte delivering habitat rocks to be placed in a Western Pennsylvania stream.



AMERICAN GOSHAWK RECOVERY IN PENNSYLVANIA AND BEYOND

Since the American goshawk was listed as endangered in Pennsylvania, the PGC has conducted annual autonomous recording unit (ARU) surveys to document activity at recently active territories, historical sites, and reported observations. When located, nests are monitored to determine status and outcome. In 2025, five active nests were discovered using ARUs, producing five young. Five of the adults and two nestlings were color banded and vaccinated against West Nile Virus.



Two of the five American goshawk nestlings reared in Pennsylvania in 2025.

Despite state efforts, little is known about goshawk breeding range and occupancy across the northeastern U.S. During the 2025 breeding season, PGC and the University of Maine, along with numerous partners, conducted bioregional monitoring across nine states. A total of 16,426 playback surveys were completed, with detections in 12% of sampling units. In Pennsylvania, 3,497 surveys yielded no detections. The data will be used to estimate regional occupancy and inform conservation strategies. [PGC](#), [DCNR](#)

HIGH PRIORITY BIRD SPECIES MONITORING CONTINUES AT WPC NATURE RESERVES

We saw a successful second year of the Monitoring Avian Productivity and Survivorship (MAPS) program at Tom's Run and Bear Run Nature Reserves in Allegheny and Fayette counties. MAPS has more than 1,400 banding stations across North America amassing data to assess bird species vital rates and population trends. PNHP staff teamed up with avian ecologists from Bird Lab to capture 264 birds, banding 185 new and recapturing 79, of 30 species. This suite included 12 Species of Greatest Conservation Need (SGCN),

such as core forest breeders like wood thrush, Louisiana waterthrush, and black-throated blue warbler. We banded six new species including Kentucky warbler, an SGCN that we were concerned had vanished from Tom's Run. MAPS enabled us to continue tracking Pennsylvania's only breeding population of Swainson's warbler. At Bear Run, we confirmed breeding for the third year by banding a new juvenile, and recaptured a male at least six years old that we banded in 2022 prior to our MAPS project. [WPC](#)



SUCCESSFUL DETECTIONS OF THE CRYPTIC LEAST SHREW

The state-endangered North American least shrew (*Cryptotis parva*) had not been seen in Pennsylvania since 2005, when it was last documented in Adams County. PNHP staff piloted a renewed search for the least shrew at Gettysburg National Military Park and the Eisenhower National Historic Site using a non-invasive surveying method called the adapted-Hunt drift fence technique (AHDriFT) which simply collects images of small animals. Potential habitats were identified and then surveyed between October 2024 and November 2025, resulting in almost 300,000 images. Through this effort we were able to determine that 16 of the 19 habitat patches were occupied by least shrew! While the species is widely distributed across the park, our results suggest that they occur at low densities. Now that the presence of the least shrew has been reconfirmed, future projects can begin surveying outside this area to hopefully understand the true extent of their range in Pennsylvania! [WPC](#), [NPS](#), [PGC](#)



INVERTEBRATE ZOOLOGY

FRESHWATER MUSSEL FINDS IN THE ALLEGHENY NAVIGATIONAL POOLS

The Pennsylvania Fish and Boat Commission surveyed freshwater mussels in Pools 6 and 7 of the Allegheny River. In Pool 6 (Clinton to Kittanning), 28 species were detected, including nine SGCN, three state/federal listed species, and one state-historic species (elephantear, *Elliptio crassidens*) not seen in Pennsylvania since 1919. In Pool 7 (Kittanning to French's Corners), 21 species were found, including seven SGCN and three listed species. The known range of several species were expanded, among them the federally listed clubshell (*Pleurobema clava*; new to Pool 6) and the state listed salamander mussel (*Simpsonia ambigua*; new to Pool 7). The remaining navigation pools will be surveyed in the coming years to provide partners a better understanding of species distribution and to inform environmental review and recovery efforts. [PFBC](#), [USFWS](#)



PFBC biologists processing mussels on the Allegheny River- Pool 6.

RESTORING THE WEST BRANCH SUSQUEHANNA RIVER

Due to coal mining pollution and dams, freshwater mussels and some host fish were eliminated in much of the West Branch Susquehanna River. In recent decades, water quality has improved due to concerted mine water mitigation efforts and the river is now suitable for aquatic life. PNHP is working to bring back three freshwater mussel species and host fish, American eel (*Anguilla rostrata*), to the river upstream of Lock Haven. In the project's first year, a study of juvenile mussel survival in the river and preliminary stocking of mussels informed the planned restoration. In 2026, PNHP staff and outside partners will stock thousands of eels infested with larvae of eastern elliptios (*Elliptio complanata*), and hatchery-reared yellow lampmussels (*Lampsilis cariosa*) and eastern lampmussels (*Lampsilis radiata*). Subsequent monitoring will track the survival of stocked mussels. If the project is successful, the once polluted river will once again be teeming with aquatic life. **WPC, PFBC**



Project partners from PFBC and WPC stocking mussels in the West Branch Susquehanna River.

MONITORING MOTHS THROUGH RAPID HABITAT CHANGE

Serpentine barrens are globally rare ecosystems that support many rare plants and insects. A new threat to this imperiled ecosystem is the southern pine beetle, or SPB (*Dendroctonus frontalis*). This tiny bark beetle primarily infests pitch and Virginia pine, but can spread to other pines and conifers during major outbreaks. SPB has spread in recent decades as climate change creates suitable conditions for it in Pennsylvania and north into New England. SPB can cause massive mortality of pitch pine, especially in dense tree stands. The DCNR Bureau of Forestry initiated a study to monitor SPB, pitch pine mortality, changes in the forest ecosystem, and impacts on other wildlife. PNHP and collaborators are conducting surveys to monitor pine-feeding moths as SPB damage spreads. We will survey again once the pitch pine mortality stabilizes. This information will help guide future stewardship and management activities, especially if SPB populations spike in pine woods elsewhere in Pennsylvania. **WPC, DCNR**



Caterpillars of the pine devil moth (*Citheronia sepulchralis*) have a selective diet, feeding primarily on the needles of pitch pines in our serpentine barrens. The extent of pitch pine mortality will determine how well pine specialists like this one will persist after the SPB outbreak.

BOTANY

A "MEETING OF THE PINES": UPDATING ONE OF PA'S LARGEST OCCURRENCES OF SHORTLEAF PINE

Shortleaf pine (*Pinus echinata*; Pennsylvania Threatened) is a large, attractive conifer species that historically occupied fire-adapted ecosystems throughout the southeastern U.S., but has since experienced range-wide decline. Pennsylvania's known populations of shortleaf pine represent a near-northernmost extent for the species. As part of the Four County Inventory Update project, PNHP staff updated populations of shortleaf pine in the South Mountain physiographic section, where some of the largest populations currently known in the state are located. This species presented certain challenges for field surveys due to the distribution of trees across a large area, as well as their tendency to hybridize with at least two other pine species. We used a one-hectare hexagonal grid cell survey system for consistency, and a species character checklist for identification of high-confidence trees and potential hybrids. In total, we tallied 167 high-confidence individuals and visited over 250 trees across 127 hectares. **WPC, DCNR**



Shortleaf pine is Pennsylvania's only pine species to produce diagnostic resin dots on its bark.

Northern witchgrass
(*Dichanthelium boreale*).

NOT ALL SURVEYS ARE FIELD SURVEYS

Heritage data remains the most taxonomically inclusive and vetted source of biodiversity information in our region. Our task is not only to report on rare elements of biodiversity, but to interpret their ecological and conservation significance as it relates to a holistic conservation approach. To do this, we utilize various available tools and resources. One approach is to review element occurrences (EOs) using a desktop tool that examines data quality and factors impacting the EO to produce a summary outcome that indicates the probability of persistence and if the EO needs a field survey. This tool identifies EOs no longer present due to significant land use changes and selects EOs to ground-truth the effectiveness of the desktop review process. Through this review, there were 7 sites with significant land use changes that likely extirpated the EOs, plus an additional 23 sites deemed unlikely to support the EOs found at them.

Another valuable resource we use daily is the myriad of herbarium specimens documenting botanical explorations over time throughout Pennsylvania. Reviewing these is often necessary to determine whether there are "new" EOs based on specimens that were previously missed or based on misidentified specimens. In 2025, we examined 5,780 witchgrass (*Dichanthelium*) specimens collected from the state and changed the identification of about 24%. In doing so, we found 14 specimens of northern witchgrass (*D. boreale*) misidentified as common species or not identified at all. Prior to this, only 19 populations of northern witchgrass were known from Pennsylvania, so the newly found specimens might make a big difference when re-assessing its conservation rank. **WPC, DCNR**



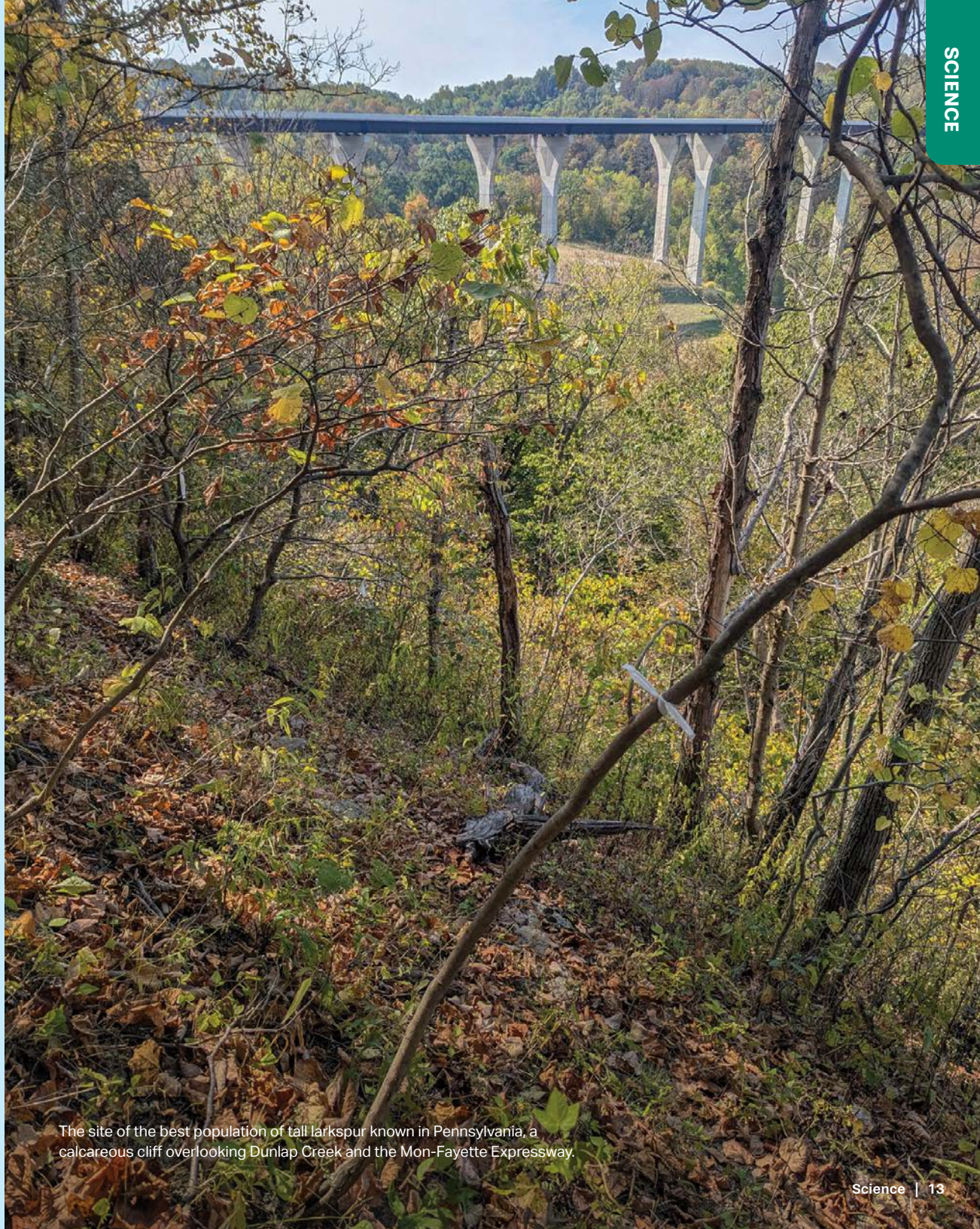
Compactors hold thousands of specimens at the Philadelphia Academy of Natural Sciences, a treasure trove of potential EO data.



Steep, calcareous cliff habitat of tall larkspur. Below: Many tall larkspur plants were very small and browsed, like this individual.

TALL LARKSPUR REVISITED

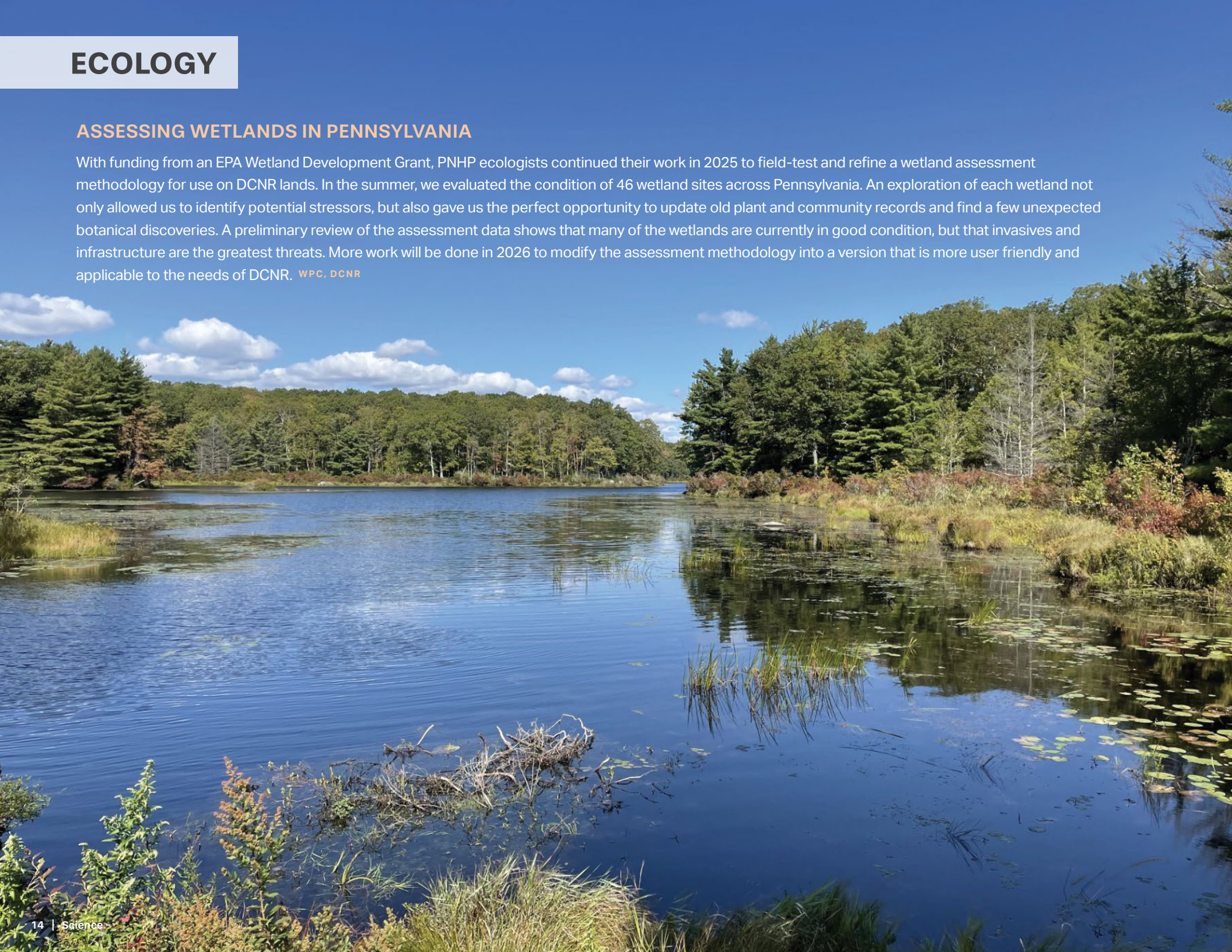
This summer we kicked off efforts to revisit, assess, and monitor populations of the globally rare tall larkspur (*Delphinium exaltatum*). This species of dry calcareous slopes is often found in very diverse places. We revisited four known sites that had not been visited in 9-30 years. We relocated plants at all sites; at the two steepest, numbers seemed similar to those observed in the 1990s, including a significant fraction of seed-producing plants. Seeds were banked with Longwood Gardens. At two other sites, however, succession and deer browse had greatly reduced the size of the plants, and almost none produced seed. In Missouri, at sites with regular prescribed burns, this species grows waist high; our plants were mostly less than six inches tall. Restoration work to limit deer browse and open the canopy could make a big difference to their viability. The Pennsylvania Turnpike Commission owns the largest known population in the state, and we are collaborating to ensure the long-term viability of this population. [WPC](#)



The site of the best population of tall larkspur known in Pennsylvania, a calcareous cliff overlooking Dunlap Creek and the Mon-Fayette Expressway.

ASSESSING WETLANDS IN PENNSYLVANIA

With funding from an EPA Wetland Development Grant, PNHP ecologists continued their work in 2025 to field-test and refine a wetland assessment methodology for use on DCNR lands. In the summer, we evaluated the condition of 46 wetland sites across Pennsylvania. An exploration of each wetland not only allowed us to identify potential stressors, but also gave us the perfect opportunity to update old plant and community records and find a few unexpected botanical discoveries. A preliminary review of the assessment data shows that many of the wetlands are currently in good condition, but that invasives and infrastructure are the greatest threats. More work will be done in 2026 to modify the assessment methodology into a version that is more user friendly and applicable to the needs of DCNR. [WPC](#), [DCNR](#)



2025 MONITORING OF BEAUTIFUL BARBARA'S BUTTONS (*MARSHALLIA PULCHRA*)

Beautiful Barbara's buttons (*Marshallia pulchra*; Pennsylvania Endangered) is truly a legacy species for PNHP's long-term conservation efforts on rare plants within the state. It is currently under review by the USFWS for potential listing status under the Endangered Species Act. This species is among a handful of specialists within Appalachian Riverscours Grassland communities—unique, dynamic ecosystems created by high-energy river flooding events that result in open, grass-dominated areas. Building on over two decades of monitoring data, PNHP staff implemented a modified monitoring protocol in 2025 to demographically characterize subpopulations of beautiful Barbara's buttons, as well as additional environmental stressors such as deer browsing, recreational damage, and late season flooding stress. We also collected tissue samples and seeds for long-term storage at partner botanical garden institutions (Atlanta Botanical Garden and Longwood Gardens) for future genetic analyses and establishment of ex situ conservation collection for augmenting our populations. This year, we visited 7 total subpopulations, collecting data on over 530 individuals! **WPC, DCNR, PGC, USFWS**



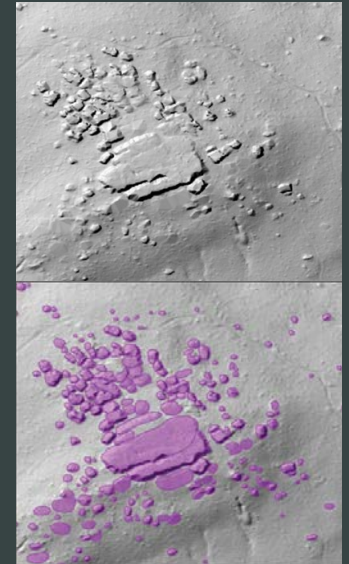
HABITAT MANAGEMENT FOR FEW-SEEDED SEDGE

Few-seeded sedge (*Carex oligosperma*) is found in open sphagnum bogs in Pennsylvania. It is an imperiled species in the state due to its habitat specificity and few known populations. Over the last six years, PNHP and DCNR have been working to improve habitat for the species at Scotch Pine Hollow. This site is a shallow, basin peatland in Tioga State Forest that has experienced vegetational changes over time; transforming from a wetland dominated by low shrubs and open patches of sphagnum carpet to more of a palustrine woodland where white pines and red maples now shade some of the open habitat suitable for few-seeded sedge. Baseline monitoring began in 2019 to document site conditions and population extent of few-seeded sedge. Selective removal of trees occurred in 2024. PNHP staff returned to the site in 2025 to resample monitoring units. Time will tell if the removal of shade producing trees results in the expansion of few-seeded sedge at the site. **WPC, DCNR**



IDENTIFYING POTENTIAL GREEN SALAMANDER HABITAT WITH MODELING

The state-threatened green salamander (*Aneides aeneus*) has a limited range in Pennsylvania and is constricted to the Pottsville Sandstone outcrops along Chestnut Ridge in Fayette County. Many occupied sites have been documented and surveyed over the years, but to properly protect and manage for the species, PNHP zoologists wanted to have a clearer picture of how much habitat still needs to be surveyed. To do this, we adapted a habitat modeling code to automatically identify areas most likely to be rocky outcrops based on slope and topographic position index. We then went through and removed false detections from infrastructure (bridges, quarries, buildings, etc.) and used hillshades and aerial imagery to draw the approximate outlines of individual rocks. This resulted in over 50,000 polygons of potential green salamander habitat. Our next task is to lace up our hiking boots and see if we can find undiscovered colonies from these potential habitats! **WPC, PFBC, PGC, DCNR**



Hillshade of a rocky area (top) and polygons representing individual rocks in that same area identified through modeling (bottom).



SPECIES HIGHLIGHT:

UNDERDOGS IN BIODIVERSITY CONSERVATION: THE SMALL AND THE SPINELESS

A vast array of life forms that lack a bony skeleton are lumped together into one bin called invertebrates. Yet they exhibit a kaleidoscope of body plans and life strategies, and outnumber vertebrates in diversity, abundance, and sheer biomass. While a few colorful examples are celebrated, like the monarch butterfly (*Danaus plexippus*), others, like spiders, are feared. Big or small, pretty or not, invertebrates play critical roles in Pennsylvania ecosystems as food for other wildlife, decomposers of organic materials, pollinators of crops and flowering plants, predators and parasitoids that control populations of pest species, and filter-feeders that consume algae in waterways.

Recognizing the importance of invertebrates in biodiversity conservation, PNHP collects information and collaborates with experts to study the rarity, habitats, and abundance of insects, crustaceans, mollusks, sponges, springtails, spiders, and other taxa. Heritage biologists and partners assessed the conservation status of nearly 1,500 invertebrates as part of the 2025-2035 Pennsylvania Wildlife Action Plan (PA WAP) update. Concerning declines in invertebrate diversity and abundance are documented around the world. Therefore, a key part of these assessments is an evaluation of the threats implicated in population decline in Pennsylvania. We found that invertebrates face challenges on many fronts, from loss of habitat, to the spread of invasive species, and impacts due to climate change. The 2025-2035 PA WAP will be finalized by the Pennsylvania Fish and Boat and Game Commissions in 2026.



CLIMATE CHANGE LOOMS LARGE IN SPECIES' FUTURES

Climate change is a threat of high concern because its effects are widespread, increasing, and difficult to mitigate. In Pennsylvania, we are seeing more frequent intense weather events from drought to flooding, extreme and fluctuating temperatures, reduced winter snowpack, and alteration of the hydrology of streams, wetlands, and groundwater systems. Climate change also disrupts the seasonal timing of key phenological events for invertebrates, like leaf out and blooming of key adult and larval food plants, and the start and end of dormancy for overwintering stages. In response to localized changes in temperature, precipitation, habitat conditions, or host plant distribution and phenology, invertebrates are shifting their ranges — not always along predictable paths. Dispersal abilities and life history limit the resiliency of invertebrates in the face of a changing climate.



Climate change can cause the timing of leaf-out and flowering of plants to become out of sync with the activity of insects that depend on them as key nectar or larval food plants.

OLD GROWTH INVERTEBRATES

Old growth forests protect biodiversity and sequester carbon, both important elements in climate change mitigation. Old growth forests have an abundance of decomposing wood, fungi, and moist, nutrient-rich, uncompacted soils, which support a wealth of invertebrates. Invertebrates in turn support old growth forests through their roles in decomposition, nutrient cycling, pollination, and tree regeneration. PNHP staff are working with taxonomic experts to identify thousands of invertebrates collected from several old growth forests sites to learn more about the diversity and abundance of key groups such as beetles, craneflies, flower flies, snails, and ants.

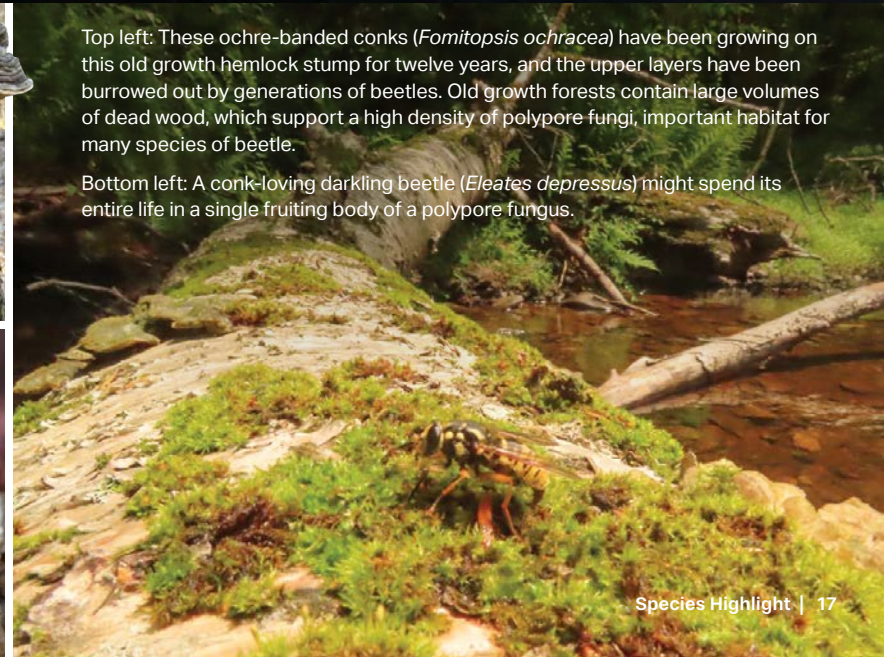


POTOMAC SPRINGSLATER

The Potomac springslater (*Caecidotea kenki*) is an aquatic isopod, a freshwater cousin of the familiar pill bug. This species lives in springs, seeps, and caves, and reaches the northern edge of its range in Fayette and Somerset counties. Its tiny eyes are an adaptation to living underground, but they are probably still functional when the organism is living in surface waters. Elimination of habitats due to limestone mining is a threat to this rare species. Caves and groundwater interfaces that occur in limestone regions may be destroyed if mining encroaches on this specialized habitat. Climate change could impact this species if below average precipitation leads to declines in groundwater levels. PNHP staff are studying this species with the support of a Wild Resources Conservation Program grant.

Top left: These ochre-banded conks (*Fomitopsis ochracea*) have been growing on this old growth hemlock stump for twelve years, and the upper layers have been burrowed out by generations of beetles. Old growth forests contain large volumes of dead wood, which support a high density of polypore fungi, important habitat for many species of beetle.

Bottom left: A conk-loving darkling beetle (*Eleates depressus*) might spend its entire life in a single fruiting body of a polypore fungus.



BUTTERFLIES IN A CHANGING CLIMATE

The silvery blue butterfly (*Glaucopsyche lygdamus lygdamus*) utilizes cool and high elevation habitats in the southern Appalachian Mountains. It is an example of a southern species whose range is shrinking instead of expanding along the north edge. The silvery blue has multiple life history characteristics that limit its adaptability; it has specialized habitat needs, only one brood per year, and caterpillars that feed on a single food plant, Carolina vetch (*Vicia caroliniana*). This spring-blooming wildflower is not particularly widespread or abundant in Pennsylvania and is readily browsed by deer.



Fortunately, some species show signs of resiliency in the face of climate change. Over the past decade, the swarthy skipper butterfly (*Nastra lherminier*) has become more common in Pennsylvania. This species has several life history characteristics helping it to adapt; it overwinters as a mature caterpillar, has multiple broods each year, and has strong populations south of Pennsylvania. The swarthy skipper has periodic boom years when adults radiate widely, giving it an advantage in colonizing new habitats that are forming at the northern edge of its range. Native plantings along rights-of-ways support grassland species like the swarthy skipper by creating habitat and corridors that facilitate movement of the species.



POWDERMILL FORESTFLY

The Powdermill forestfly (*Soyedina merritt*) lives in limestone springs and seeps and is endemic to the Laurel Highlands, straddling the Pennsylvania – West Virginia state line. Aquatic nymphs of this stonefly emerge each March to mate and lay eggs. Groundwater in karst geology is susceptible to swings with precipitation and to pollution from surface waters. The flow of cool, alkaline waters would be compromised if hydrology in the region is greatly altered by climate change. Warmer water temperatures or decreasing flows would degrade habitats for the Powdermill forestfly. PNHP biologists have a Wild Resources Conservation Program grant to study this stonefly and others.



FRESHWATER JELLYFISH

You don't have to go to the ocean to see jellyfish. A freshwater jellyfish (*Craspedacusta sowerbii*), smaller than a penny, inhabits many commonwealth lakes and rivers. Introduced from China, the tiny jellyfish feed on zooplankton and can consume larval fish. Their sting cannot penetrate human skin. The jellyfish may reduce populations of native fishes and zooplankton, but their impacts are not well studied. While they are limited by temperatures, the warming water temperatures related to climate change are predicted by scientists to increase the suitable habitat throughout most of North America.



YELLOW-BANDED BUMBLEBEE

The yellow-banded bumblebee (*Bombus terricola*) is a pollen generalist, meaning that it pollinates a wide variety of flowers and crops that bloom throughout the season. Unlike most bees, bumblebees live in colonies that persist for the whole growing season. This species declined dramatically in the 1990s, probably due to introduced pathogens, but the species has been recovering in recent years and is once again widespread in Pennsylvania. The bee has not returned to some of the areas on the southern edge of its range, suggesting that warmer temperatures from climate change may be limiting where it can survive.

FEMININE CLAM SHRIMP

Animals that depend on specialized habitats are especially vulnerable to climate change. For example, the globally-rare feminine clam shrimp (*Cyzicus gynecia*) utilize short hydroperiod vernal pools and persistent puddles that lack fish. Clam shrimp are filter feeders that capture tiny organic particles and organisms. They contribute to the ecology of very temporary wetland habitats by cycling nutrients and feeding predators that visit these habitats. Vernal pools are impacted by increasing episodes of drought which can cause vernal pools to fail to fill or dry out during the critical spring period, which would not allow for the successful reproduction of clam shrimp and other vernal pool wildlife. **WPC, PFBC, DCNR**



INFORMATION

PNHP information is far from static. Each year brings new records and new ways of distributing our information. Additionally, this information is critical in planning our field work. New projects that add data focused on specific species, groups of organisms, and natural features will build on and make available a wealth of information.

A MODERN FUNGA OF PENNSYLVANIA

The state fungi list is now available on the PNHP website (www.naturalheritage.dcnr.pa.gov/Fungi.html). The list represents the fungi (including lichens) that are native or introduced to Pennsylvania and whose presence is supported by DNA barcoding or modern records verified by trusted identifiers. Some new state records that made the list include *Tricholoma lutescentifolium* which PNHP Conservation Mycologist Hannah Huber found in 2024 before it became a published species in 2025; *Tricholomopsis floccosa*, found by Karen Beall just a year after the species was published in 2023; the diminutive *Mycena mirata* found by Cara Coulter; and the big bellied webcap (*Phlegmacium largum*) found by John Plischke, who also made the first observation of the rancid greyling (*Tephrocybe rancida*) from the northeast and mid-Atlantic regions. Since North American fungi are understudied, it can be unclear whether a new record represents a native species that has simply gone unnoticed, or an introduced arrival. Regardless, we can celebrate our growing understanding of the Pennsylvania funga. **WPC, DCNR**



Mycena mirata, a new state record found and photographed by Cara Coulter.

MEETING THE DEMANDS OF NHA UPDATES

Last year, PNHP rolled out a suite of upgraded tools to streamline the way we create and update Natural Heritage Areas (NHAs). NHAs are PNHP designated sites that highlight important areas of biodiversity and, through accompanying site reports, communicate opportunities for conservation and stewardship. The implementation of the upgraded tools greatly

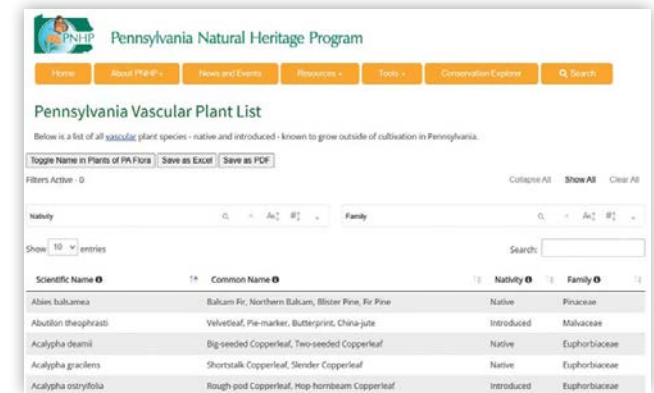


The spatial boundaries of over 600 NHAs were updated this year, representing about 15% of the total number of existing NHAs. The high concentration of updates in the South-Central and North-Central counties reflect active projects we were working on in 2025.

improved the efficiency of our workflow and led to measurable results in 2025. We revised over 600 NHAs with updated spatial boundaries and species lists, submitted nearly 50 written site account updates, and, with the help of volunteers and work study students, databased over 3,000 site accounts. With nearly 4,000 existing NHAs in our database and new NHAs designated each year as new species occurrences are discovered, there is a high demand for keeping NHAs current. The upgraded tools position us to meet this demand, ensuring that NHAs continue to serve as a core resource for conservation planning across Pennsylvania. **WPC**

PENNSYLVANIA'S NEWEST BOTANICAL RESOURCE: PA VASCULAR PLANT LIST

In 2025, botanists at PNHP and DCNR developed a new online resource to help Pennsylvanians better understand the plants around them – we've created an updated list of naturalized vascular



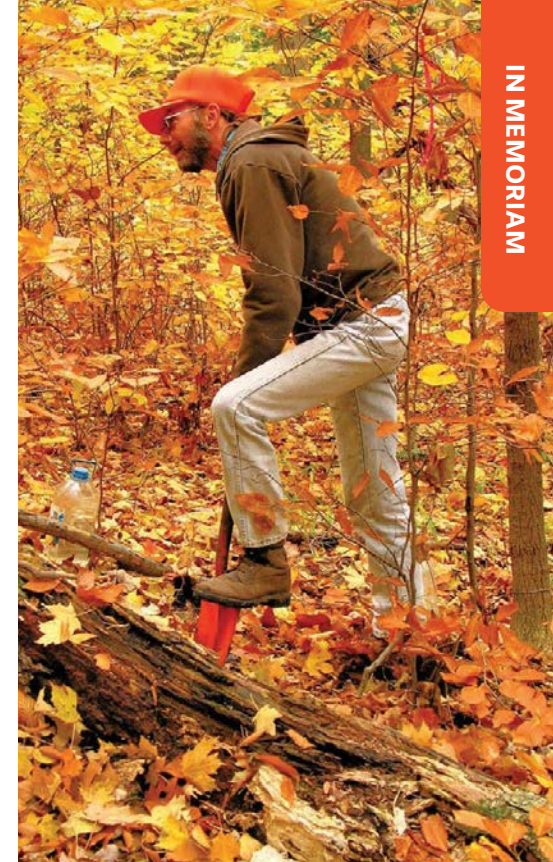
plant species in the state. Plants on the list are categorized as native or introduced, and the names used are cross-walked between our new taxonomic standard, the Flora of the Southeastern U.S. (2023), and those used in the Plants of Pennsylvania 2nd edition (2007). Associated explanatory materials and resource links contribute to making this a rich resource for botanists and plant-curious folks in Pennsylvania and beyond. Check it out here: <https://www.naturalheritage.dcnr.pa.gov/PlantChecklist.html>. **WPC, DCNR**

SPATIAL FEATURE RECORDS IN BIOTICS

TAXONOMIC GROUP	NEW SPATIAL FEATURES ADDED IN 2025	SPATIAL FEATURES UPDATED IN 2025	SPATIAL FEATURES CUMULATIVE TOTAL
Birds	223	797	4,111
Butterflies & Moths	9	69	1,611
Communities	52	239	2,556
Fish		5	2,564
Freshwater Mussels	289	813	5,888
Fungi & Lichens			33
Geologic & Hydrologic Features		5	636
Mammals	269	972	4,478
Non-vascular Plants	6	6	61
Other Invertebrates	8	14	2,582
Reptiles & Amphibians	213	331	12,637
Vascular Plants	549	1379	28,783
Grand Total	1,618	4,630	65,940



IN MEMORIAM: JIM HART



IN MEMORIAM

In October, Pennsylvania lost the legendary mammalogist, Jim Hart. How can one sum up Jim? He was such a fixture in Pennsylvania conservation that he seemed to have always been here... championing the importance of small mammals to any willing (or unwilling) audience. His passion for filling data gaps for the least understood and unappreciated mammals was only matched by his enthusiasm for teaching the next generation of mammal enthusiasts. We frequently gave Jim a hard time for his approach, but matching Jim's gruff demeanor was the best way to get the job done. Jim's former supervisor, mentor, and friend, Jerry Hassinger, summed it up well with this comment: *"Being around Jim was often frustrating. You knew he had potential that his mouth would subvert at every opportunity. Dr. Gordie Kirkland and I made a pact that he would try to get Jim to quit smoking and I would get Jim to stop talking. Obviously, we both failed miserably."* Today, PNHP staff rely on the foundational body of work Jim left for us and we will miss Jim's dedication and knowledge on all things mammal!



APPLICATION

Our work is conservation focused, and we look for opportunities to match our information and expertise with planning, management, and stewardship efforts that will benefit our vulnerable species as well as our natural and human communities.

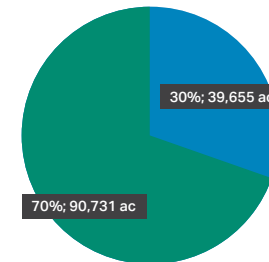


Northern long-eared bat

CELEBRATING THE FIFTH YEAR OF THE STATE LANDS BAT HCP

The Pennsylvania Game Commission and DCNR completed the fifth year of the State Lands Bat Habitat Conservation Plan (HCP) with U.S. Fish and Wildlife Service. The 30-year HCP gives the agencies the opportunity to ensure habitat management (forest harvesting, prescribed fire, firewood cutting, and road/trails) is focused on improving habitats for Indiana and northern long-eared bats while also streamlining the permitting process through an Incidental Take Permit. Thousands of acres of habitat have been improved over the past five years while the agencies have consistently stayed well under the amount of permitted 'take' acreage. Similarly, the agencies have already exceeded the number of artificial roosts established for the 30-year plan. An amendment is currently being developed to add little brown and tricolored bats to the HCP. This Plan has been so successful that several states across the nation are using it as a model to develop their own Bat HCP. [PGC](#), [DCNR](#), [USFWS](#)

NORTHERN LONG-EARED BAT



July 1, 2024 – June 20, 2025

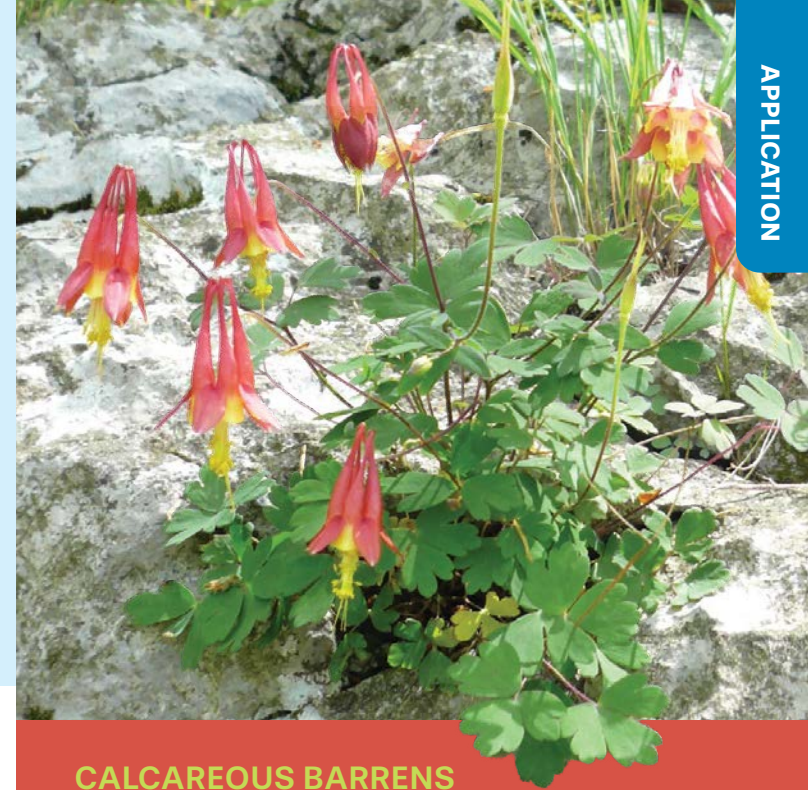
- Acres Taken by Covered Activities
- Acres Permitted but Unaffected

Acres of northern long-eared bat habitat taken by covered activities (blue) during Year 5 (July 1, 2024 – June 30, 2025) compared to unaffected permitted take (i.e., remaining take; green) for the foundational PGC and DCNR State Lands Bat Habitat Conservation Plan.



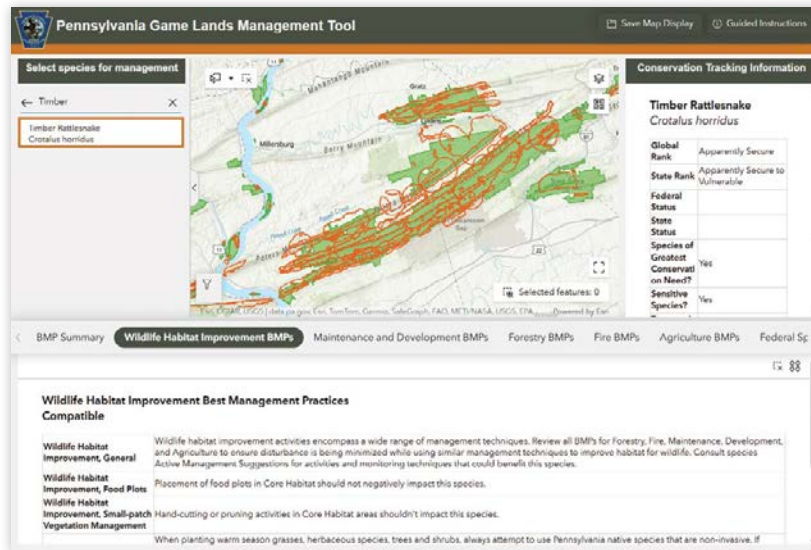
DEVELOPMENT OF AN OLD-GROWTH ASSESSMENT METHODOLOGY

Over the last few years, PNHP ecologists traveled across Pennsylvania in search of old-growth forests. We were interested in not only documenting the location of these forests, but also identifying the common characteristics that Pennsylvania's old forests share with each other. Building on these observations, along with supporting old-growth research, we developed an old-growth rapid assessment methodology that managers can use to gain a better sense of how close their aging forests are to true old growth. This methodology will help managers recognize which characteristics already exist in their forests and which they may want to promote. This was the final year for testing and refining our old-growth assessment methodology. We are currently finalizing the methodology and are excited to publicly introduce the old-growth assessment through training sessions in spring 2026. [WPC, DCNR](#)



A NEW GENERATION OF LAND MANAGEMENT TOOLS FOR THE GAME COMMISSION

The Pennsylvania Game Commission and PNHP completed a modernization of the Pennsylvania Game Lands Management Tool (PGLMT), an interactive web-tool that provides Best Management Practices (BMPs) to habitat managers for Species of Greatest Conservation Needs (SGCN) that occur in a given area. By identifying the BMPs early in the planning process, habitat managers can better coordinate and modify their practices to best meet the needs of SGCN, while also providing insights on the interactions between various management scenarios. Having the information from the PGLMT will also better inform and streamline the required Environmental Review process. [PGC, WPC](#)



CALCAREOUS BARRENS

For several years, PNHP has been writing Recovery Plans for our globally endangered plant species. Recently, we expanded this approach to habitat recovery plans. Why use habitat as a focus for conservation? If we focus conservation efforts on plant habitats, we protect the entire suite of species that depend on the habitat. The Calcareous Barrens Habitat Recovery Plan catalogues sites across the state that host this unique ecosystem and describes regional subtypes. To facilitate conservation, it identifies reference sites and provides conservation recommendations focused on habitat condition and indicator species. Calcareous barrens are highly diverse with many habitat specialists. Some are maintained by environmental conditions, while others require fire or other disturbances. Calcareous barrens are particularly in need of active stewardship, and all are vulnerable to invasive species. The plan lays the science-based framework for understanding these habitats and guiding restoration efforts. [WPC, DCNR](#)

COLLABORATION AND COMMUNITY

Collaboration helps PNHP expand our knowledge and capacity while helping our partners manage ecological resources through our expertise and unique datasets.

PARTNERSHIP CELEBRATES NINTH CONSECUTIVE SUCCESSFUL PIPING PLOVER NESTING SEASON

The Pennsylvania Piping Plover and Common Tern Recovery Partnership celebrated two piping plover nesting pairs that produced seven fledglings, plus an unmated male that stayed for the season. These small numbers may not seem impressive until you consider piping plovers are the most endangered shorebird in the Great Lakes, with fewer than 200 known adults on the planet, the five that called Presque Isle State Park home in summer 2025 are important (~3% of the global breeding population). For nearly 20 years, the Game Commission has led a multi-partner recovery team to restore habitat and manage this federal and state endangered species. Piping plovers returned as nesting birds in 2017, following a more than 60-year absence, thanks to the efforts of many dedicated field biologists and volunteers throughout the Great Lakes and the Pennsylvania partnership's preparedness. To date, Pennsylvania has hosted 1-4 pairs annually (20 pairs total) and supported an astonishing 47 chicks to take flight. [PGC](#), [DCNR](#), [WPC](#), [USFWS](#)



A 2025 piping plover fledgling struts down the shoreline at Presque Isle State Park, Erie Co. before leaving for southeastern U.S. wintering areas. Colored leg bands assist tracking this individual throughout their life. All banding, marking, and sampling is conducted under a federally authorized Bird Banding Permit issued by the U.S. Geological Survey's Bird Banding Lab.



NPS Field Technicians Hannah Cabell and Sara Thiessen measure the growth of trees at Friendship Hill National Historic Site

PNHP SUPPORTS OUR NATIONAL PARK SERVICE PARTNERS

Ecologists in the National Parks, Historic Sites, and Battlefields in the Eastern Rivers and Mountains Network (ERMN) conduct long term monitoring activities to track changes in selected park resources and processes, called vital signs, to understand the overall health or condition of park natural resources. PNHP has assisted the National Park Service (NPS) in the ERMN for several years, investigating change in vegetation composition, forest structure, and impacts from deer browsing. In 2025, PNHP conducted assessment and monitoring activities at Flight 93 National Memorial in Shanksville, Pennsylvania, and at the First State National Historic Park, which spans the border of Chester County, Pennsylvania and New Castle County, Delaware. Additionally, PNHP hired a team of field technicians who conducted monitoring activities at the ERMN parks from Delaware Water Gap National Recreation Area in Eastern Pennsylvania and New York to the Gully River National Recreation Area in West Virginia. [WPC](#)

FINDS FROM THE FOUR COUNTY UPDATE

The Four County Inventory has been a 2-year effort to update Natural Heritage Areas (NHAs) in Adams, Cumberland, Franklin, and York counties. This collaborative effort was spearheaded by the South Mountain Partnership (SMP), a network that protects and promotes the region’s natural resources. SMP obtained funding, contracted WPC, and helped connect landowners and partners. PNHP biologists with WPC and DCNR conducted surveys; data from PFBC, PGC, and community scientists were also used. The result will be updates to over 220 Natural Heritage Areas and more than 67 species records.

Notable finds include compact dodder (*Cuscuta compacta*) in peaty wetlands, blooming vase-vine leather-flower (*Clematis viorna*) on a limestone slope, black star fungus (*Glonium stellatum*) on dead blackened wood, smooth axil-bristle lichen (*Myelochroa galbina*) found by community scientists, breeding vesper sparrows (*Pooecetes gramineus*), and least shrew (*Cryptotis parva*) in grasslands. **WPC, DCNR**



Vase-vine leatherflower (*Clematis viorna*)
Left: Vesper sparrow (*Pooecetes gramineus*)

PPCA: AN AVENUE TO CONSERVE THE RAREST OF THE RARE PLANTS

The PA Plant Conservation Alliance (PPCA) is a program of DCNR and part of PNHP whose mission involves conserving rare species including globally rare plants in Pennsylvania. This program has brought together DCNR, WPC, and many other partners to conserve the rarest of our rare plant taxa. The program is coordinated out of and funded by DCNR and allows for PNHP to strategically use botanist time and contracting funds to monitor and steward globally rare plant taxa around the commonwealth. The dedicated time and funds are invaluable in conserving rare plants. So far, PPCA and partners are actively working on 14 species with activities spanning from writing Recovery Plans to active in situ and ex situ stewardship and management. There are several more species in the process of having assessments and Recovery Plans written. We’re excited to grow and expand the program in the coming years!



DCNR, WPC, USFWS, PGC

PPCA ACTIVITY	NUMBER OF SITES WHERE ACTIVITY IS HAPPENING
Intensive Monitoring	55
Stewardship	40
Ex situ Collections	35
Outplanting	12

INTERNATIONAL WORKING GROUP ADVANCES RECOVERY FOR THE EVENING GROSBEAK

Not often are we doing conservation across a species’ full range, especially one spanning North America. Yet, since 2021, we have been working with partners to lead efforts for the evening grosbeak through a Road to Recovery Working Group. This past year we continued to fill-in migratory connectivity gaps by tracking grosbeaks tagged in Michigan, New York, Vermont and New Hampshire. We saw growth in the working group with Canadian agencies and organizations tagging and tracking birds from western and eastern Canada and the Northern Forest Birds Network helping expand grosbeak color-banding sites. The group took strides toward recovery, learning more about the species’ high vulnerability to window collisions and launching three community science projects. We formed teams to analyze >100,000 tracking points from Midwest and Northeast populations and to develop a paper on the grosbeak’s status to formally identify priorities for recovery for a bird that’s lost more than 90% of its population since 1970. **WPC, USFWS**



SPREADING THE WORD

In addition to social media and our quarterly newsletter, we also share information and expertise through education and outreach. From taxonomy workshops to helping landowners understand the resources on their property, these opportunities are extremely valuable in mobilizing other scientists and the public to conserve biodiversity.

WETLAND PLANT IDENTIFICATION MODULES ARE NOW ONLINE

For the past two years, PNHP staff have been working with Pennsylvania's Department of Environmental Protection (DEP) to develop wetland plant identification training modules. While the modules are primarily meant for professionals learning wetland determination in Pennsylvania, they were designed for a broad audience and can be used by anyone with an interest in learning the basics of wetland plant identification. Three modules are currently complete and include information on general plant identification tips, basic terminology, important characteristics, and how to identify a number of trees, shrubs, and woody vines which are commonly found in Pennsylvania wetlands. A forthcoming module will focus on the identification of common herbaceous wetland plants. The completed modules are freely available on the DEP Clean Water Academy website, and can be found within the Introduction to Wetland Determination course. [WPC, DCNR, DEP](#)

PNHP COLLABORATES WITH THE PENNSYLVANIA MASTER NATURALISTS

Pennsylvania Master Naturalist is a statewide initiative that aims to connect people with their local ecosystems through intensive natural science training and local conservation service work. For several years, PNHP has collaborated with PA Master Naturalist to provide instruction in plant community ecology, zoology, and botany for volunteers in county-based programs across the state. Training for each group includes classroom instruction on one of the natural history subjects and follow-up field trips to local natural areas to see the material in the field. Pennsylvania Master Naturalist volunteers are vital to building capacity in our community to help protect and manage sites of high conservation importance. We see this type of collaboration as incredibly valuable and look forward to continuing our partnership with the highly informed community scientists trained through this program! **WPC, DCNR**



PNHP Senior Director of Conservation Science Ephraim Zimmerman leads a field trip to Forbes State Forest to learn characteristic plant species of forest communities in the Laurel Highlands.

The NEPARC meeting included a poster session where attendees could share research, techniques, and projects related to amphibian and reptile conservation.



ANNUAL CONFERENCE COMES TO PENNSYLVANIA

Senior Non-Game Biologist and Herpetologist Kathy Gipe was the primary planner for the annual meeting of the Northeast Partners in Amphibian and Reptile Conservation (NEPARC). This three-day meeting is hosted by each of the northeast states in turn, and it was high time to bring it back to Pennsylvania in August 2025. We held it at the Pocono Environmental Education Center and had record attendance of 175 people, including seven participants from the PNHP partnership. We organized and led field trips the first day of the meeting. Senior Zoologist Ryan Miller presented the results of a Wild Resource Conservation Fund study on the green salamander, while PFBC staff presented a poster about a study of wildfire impacts on a box turtle population. Charles Bier, WPC retired Senior Director of Conservation Science, gave the keynote presentation "Slowly Shifting Paradigms: A Career in Biodiversity Conservation." **WPC, PFBC, DCNR**

INVASIVE SPECIES

We focus considerable effort on invasive species because they represent a major threat to our native species, including some of our rarest species. By documenting invasive species, understanding their distribution, assessing their effects on our rare native species, and direct control, we work to address these threats.

A high-quality dry woodland community on a State Game Land in Blair County where invasive and endangered plants intermingle near the edge of a sandstone cliff.

FIRST COLLECTIONS OF INVASIVE RED SWAMP CRAYFISH IN THE SUSQUEHANNA RIVER BASIN

In August 2025, PNHP staff and the Pennsylvania Fish and Boat Commission (PFBC) surveyed Indian Park Pond, Montoursville, Lycoming County for the presence of invasive red swamp crayfish (*Procambarus clarkii*), following a report from an angler with a photo of a possible red swamp crayfish. With permission from the municipality, biologists surveyed the pond with dip nets and confirmed the presence of an established population of the crayfish on site, which may be the first officially documented population of this species in the Susquehanna River basin. Red swamp crayfish are a large, aggressive, aquatic invasive species that may negatively impact sportfish, crayfish, amphibians, and other native species. While the population cannot be eliminated, staff are working with partners on outreach to prevent spread and have prepared a manuscript communicating this find, which recently was accepted for publication in the journal *Northeastern Naturalist*. **PFBC, WPC**



GARDEN ESCAPEES SPOTLIGHTED IN INVASIVE SPECIES SCAVENGER HUNT

In summer 2025, the WPC and DCNR's Pennsylvania iMapInvasives Program hosted its 6th annual Invasive Species Scavenger Hunt (view the report at <https://shorturl.at/pu3zg>).

This statewide survey encourages natural resource professionals and community scientists to search anywhere in the commonwealth for several invasive species and report findings. The event's "Garden Escapees" theme challenged surveyors, 25 in total, to look for the following five invasive plants known to be escaping from cultivation into nearby natural areas such as parks, forests, and game lands:

- Burning bush (*Euonymus alatus*)
- Japanese spiraea (*Spiraea japonica*)
- Bishop's goutweed (*Aegopodium podagraria*)
- Garden loosestrife (*Lysimachia vulgaris*)
- Ravenna grass (*Tripsidium ravennae*)

Since 2020, the Scavenger Hunt event has helped numerous participants recognize the proliferation of common invasive species in Pennsylvania, encouraged searches for newly emerging species in natural areas, and furthered our understanding of species' distributions in the state. **WPC, DCNR**



Japanese spiraea can outcompete and displace many native woody and herbaceous plants and impedes growth of native seedlings.

Invasive common reed encroaching in a high-quality bog on a State Game Land in the Poconos.



PRIORITIZING PLANT INVASIONS ON PA STATE GAME LANDS

Pennsylvania's State Game Lands are more than just places to hunt. These public properties protect habitat for a variety of wildlife, plants, and natural communities. Invasive plants create a major disruption to habitats, impacting their ability to support native species and hunters alike. We partnered with the Pennsylvania Game Commission to assess invasive plant populations in high-quality natural areas on game lands. This work has been ongoing over the past three years and expanded to southcentral and eastern Pennsylvania in 2025. Surveys identified critical invasive plant threats, early-detection invasive species populations, and even new populations of threatened and endangered plants. We used field data to produce management recommendations that prioritize addressing the greatest threats to conservation targets while weighing the unique sensitivities of each site. The resulting management strategies are carefully curated for controlling invasive plants where rare species populations are at stake. [WPC, PGC](#)

IMAPINVASIVES

Tracking the locations of invasive species in Pennsylvania is a primary goal of the Pennsylvania iMapInvasives database, a free-to-use online platform that encourages reports for all taxa of invasive species from natural resource professionals and members of the public. Each year, the database grows with new information submitted for novel findings, emerging invaders, and common species whose distributions are helpful to know for management purposes.

The following table highlights invasive species observations reported in 2025 and totals for all records added since the database began in 2011. Note: All "presence" information has been expert-vetted by trusted professionals.

In addition to presence reports, the iMapInvasives program tracks areas where invasives have not yet been found (not-detected) and management efforts (documented treatment).



	2025 PRESENCE RECORDS ADDED*	DATABASE TOTAL – PRESENCE*	DATABASE TOTAL – NOT DETECTED	DATABASE TOTAL – DOCUMENTED TREATMENT
Aquatic	118	16,105	2,771	147
Terrestrial	4,631	55,185	9,043	964
Animals	62	14,548	2,287	22
Plants	4,687	56,666	9,521	1,053
Fungi, Protists, and Bacteria	-	76	6	-

*Confirmed records only

NEW INVASIVE FUNGI LIST

The golden oyster mushroom is an edible cultivar that grows on wood, whereas the death cap mushroom is deadly poisonous but forms a mycorrhizal symbiosis with trees. Neither is a pathogen, but they're both introduced and invasive in Pennsylvania. The Pennsylvania Invasive Species Council (PISC) had fungi scattered across lists for "aquatic animal pathogens" and "plant pathogens," but PNHP's Conservation Mycologist Hannah Huber posited that these categories were limiting, and that fungi deserved their own list. The listing committee agreed. Invasive non-pathogenic fungi can compete with native fungi for habitat, facilitate the spread of associated invasive plants, be less beneficial mycorrhizal partners, or potentially alter nutrient cycling. They may also present another poisonous species that foragers must learn to avoid. The new list adopted by the Council can be found on the PISC webpage. [WPC, DCNR](#)



A wild fruiting of golden oyster mushrooms (*Pleurotus citrinopileatus*) at Shenks Ferry Wildflower Preserve (Lancaster County) that escaped from cultivation.



FINANCIALS

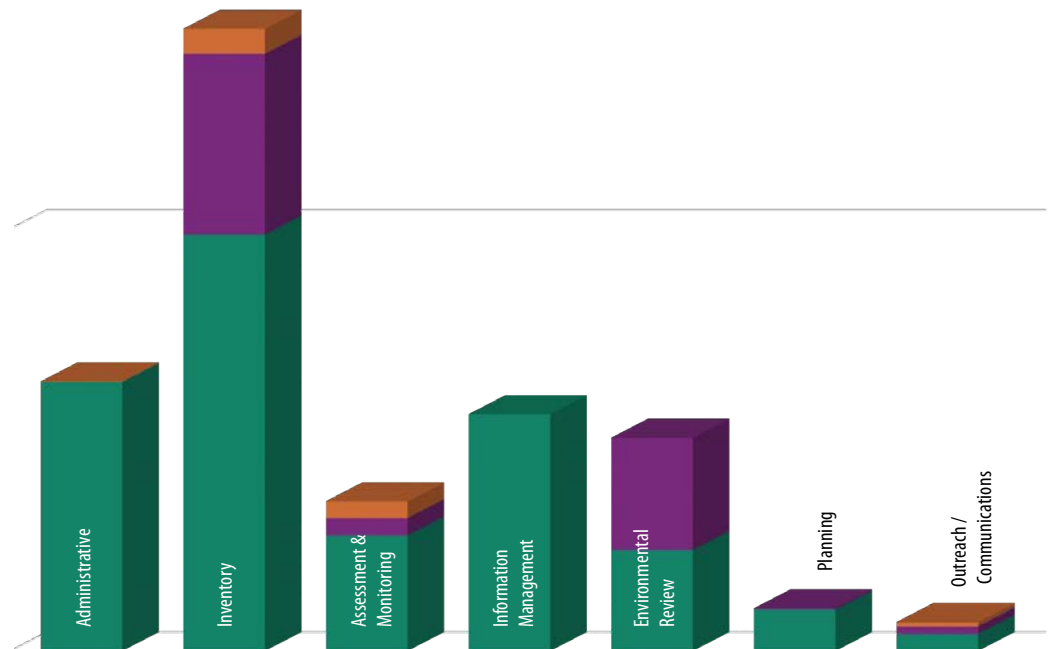
PROGRAM FUNDING - 2025

Our funding reflects the large amount of work we do with state and federal agencies. Local sources of funding include counties, municipalities, and NGOs. We also raise funds from private sources including businesses and private foundations. Inventory work represents the largest single investment of funds in the program. Environmental Review, Assessment and Monitoring, Information Management along with Inventory represent over 75% of the program expenditures, these being the core functions of PNHP.



Relative Proportion of Funding by Program Area

■ State ■ Federal ■ Private



Percentage of total funding: 76% state, 19% federal, 5% private



WE WOULD LIKE TO RECOGNIZE THE MANY ENTITIES AND PROGRAMS THAT SUPPORTED OUR WORK IN 2025:

Pennsylvania Department of Conservation and Natural Resources

- Bureau of Forestry
- Wild Resources Conservation Program
- Community Conservation Partnership Program Grants
- Bureau of Forestry Research Fund
- U.S. Fish and Wildlife Service, Section 6 grants
- U.S. Environmental Protection Agency, Wetlands Program Development Grants

Pennsylvania Department of Environmental Protection

- U.S. Environmental Protection Agency, Wetlands Program Development Grants
- Clean Water Fund

Pennsylvania Game Commission

- State Wildlife Grants
- Pittman-Robertson Fund

Pennsylvania Fish and Boat Commission

- State Wildlife Grants

Pennsylvania Department of Agriculture

- Research Grants

Pennsylvania Department of Transportation

Pennsylvania State University, Pennsylvania Sea Grant

- Great Lake Restoration Initiative Funds

U.S. Forest Service

- Allegheny National Forest
- Great Lake Restoration Initiative Funds (Cooperative Weed Management Program)

U.S. Fish and Wildlife Service

- Great Lake Restoration Initiative Funds
- Science Application Funds

U.S. National Park Service

U.S. Army Corps of Engineers

NatureServe

National Fish and Wildlife Foundation

The Charles Kaufman Fund

The John Oliver Fund

Dan Nydick Family Endowment for Conservation Science

Allegheny County Parks Foundation

The Knobloch Family Foundation

The Richard King Mellon Foundation

Nuttall Ornithological Club

Pashek+MTR

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Finch Research Network



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Thank you, friends.
Keep using those Oxford
commas! Editor signing off.