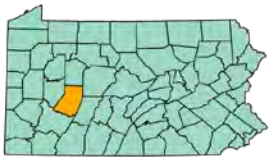
Indiana County Natural Heritage Inventory



Update 2021

Pennsylvania Natural Heritage Program

Indiana County
Natural Heritage Inventory

2021 Update

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Advisory Committee to the 2021 update to the Indiana County Natural Heritage Inventory:

- Byron Stauffer Jr. — Indiana County Executive Director of Planning and Development
- Jeff Raykes — Indiana County Planner
- Josh Krug — Indiana County Planner

We want to recognize the Pennsylvania Natural Heritage Program and NatureServe for providing the foundation for the work that we perform for these studies. Current and former PNHP staff that contributed to this report includes JoAnn Albert, Jaci Braund, Charlie Eichelberger, Kierstin Carlson, Mary Ann Furedi, Steve Grund, Amy Jewitt, Anna Johnson, Susan Klugman, John Kunsman, Betsy Leppo, Jessica McPherson, Molly Moore, Ryan Miller, Greg Podniesinski, Megan Pulver, Erika Schoen, Scott Schuette, Emily Szoszorek, Kent Taylor, Christopher Tracey, Natalie Virbitsky, Jeff Wagner, Denise Watts, Joe Wisgo, Pete Woods, David Yeany, and Ephraim Zimmerman.

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The success of the report will be measured by the use it receives and the utility it serves to those making decisions about resources and land use throughout the county. Thank you for your interest.

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2 THE PENNSYLVANIA NATURAL HERITAGE PROGRAM

The Pennsylvania Natural Heritage Program (PNHP) is a partnership between the Western Pennsylvania Conservancy (WPC), the Pennsylvania Department of Conservation and Natural Resources (DCNR), the Pennsylvania Game Commission (PGC), and the Pennsylvania Fish and Boat Commission (PFBC). Founded in 1982, PNHP is part of a network of Natural Heritage Programs that utilizes common methodology developed by Heritage Programs and The Nature Conservancy, and refined through NatureServe – the organization that represents the network of Natural Heritage Programs (see sidebar at right).

PNHP collects and stores location and baseline ecological information about rare plants, rare animals, unique plant communities, significant habitats, and geologic features in Pennsylvania. The PNHP database is Pennsylvania's chief storehouse of such information with almost 30,000 detailed digital occurrence records. Though not a regulatory organization, as part of its function, PNHP provides expert input on species impacted by projects that require permits issued by the Pennsylvania Department of Environmental Protection (DEP). Although data from PNHP feed into the environmental review tool known as the Pennsylvania Natural Diversity Inventory (PNDI), the process of environmental review is housed within DCNR, PFBC, and PGC.

As part of the information maintained by PNHP, a system of *global ranks* and *state ranks* is used to describe the relative degree of rarity for species and natural communities. This system is especially useful in understanding how imperiled a resource is throughout its range, as well as understanding the rarity of resources that do not have official state status, such as invertebrate animals and natural communities. A summary of global and state ranks can be found in the methods section.

NatureServe
Connecting Science With Conservation

NatureServe, the natural heritage network, was originally founded by The Nature Conservancy in the early 1970s, with the first program established in South Carolina in 1974. The concept was to create a federation of programs in all 50 U.S. states, using a common database and data management methodology, to document the extent of biodiversity throughout the country with an emphasis on rare and threatened species and natural communities. Many programs were established with state environmental protection or natural resource agencies, while some are housed in universities. Pennsylvania's partnership with three agencies and a non-profit is unique among the programs.

Over time the heritage network has expanded throughout Canada and 12 Latin American countries. In 1994, the Association for Biodiversity Information (ABI) was founded to more closely coordinate activities of the network, and ABI transformed into NatureServe in 2001 as The Nature Conservancy transferred administration of the network to NatureServe.

All programs in the heritage network use a common data management system outlined on these pages, based on the original concepts of elements, element occurrences, and rarity ranks. Today, the NatureServe network stands as the most comprehensive source of information on the locations and status of biodiversity and natural communities throughout the western hemisphere.

PNHP is valuable for its ability to supply technically sound data that can be applied to natural resource decisions. Information on the occurrences of elements of special concern (species and natural communities) gathered from museums, universities, colleges, and recent fieldwork by professionals throughout the state is used by PNHP to identify the areas of highest natural integrity and significance in Indiana County. The Indiana County Natural Heritage Inventory (CNHI) report presents the known outstanding natural features in the county. The CNHI provides maps of the best natural communities (habitats) and all the known locations of animal and plant species of concern (endangered, threatened, or rare)in the county. A written description and a summary table of each of the sites, including quality and degree of rarity are included.

3 INTRODUCTION

Yellow Creek Lake Photo: PNHP

This project is a comprehensive update to the Indiana County Natural Areas Inventory project of 2011. This current project was initiated to update the documentation of previously known species of concern (those considered at risk of local or global extinction), to identify additional habitats supporting species of concern, and to provide conservation recommendations to help ensure their continued survival within the region. The ability of a community to fulfill its vision for the future depends on its capacity to assemble information that will enable it to act effectively and wisely. Since 1989, County Natural Heritage Inventories (CNHIs) have served as a way to both gather and pass along new and existing information to those responsible for land use decisions, as well as to all residents who wish to know more about the natural heritage of their county. The Indiana County Natural Heritage Inventory focuses on the best examples of living ecological resources in the county. The Western Pennsylvania Conservancy (WPC) served as the principal investigator, prepared the report, and created the maps for this study. The Pennsylvania Natural Heritage Program (PNHP), of which WPC is a partner, is responsible for collecting, tracking, and interpreting information regarding the state's biological diversity.

A healthy natural environment is essential to human health and sustenance. A healthy environment provides clean air and water; supports fish, game, and agriculture; and furnishes renewable sources of materials for countless aspects of our livelihoods and economy. In addition to these direct services, a clean and healthy environment plays a central role in our quality of life, whether through its aesthetic value (found in forested ridges, mountain streams and encounters with wildlife), or in the opportunities it provides for exploration, recreation, and education. Finally, a healthy natural environment supports economic growth by adding to the region's attractiveness as a location for new business enterprises, and provides the basis for vibrant recreation, tourism, and forestry industries. Fully functional ecosystems, rich in biological diversity, are key indicators of a healthy environment; working to maintain these ecosystems is essential to the long-term sustainability of our economies.

Planning for long-term sustainability can maintain open space, including natural environments and the plants and animals associated with them. Using this Natural Heritage Inventory as a conservation tool can steer development away from environmentally sensitive areas, creating a needed balance between economic growth and the conservation of natural resources. It is important that county and municipal governments, the public, developers, and planners know the location of such environmentally sensitive areas in order to maintain and protect these areas. Knowing where these areas are located can help prevent potential land use conflicts, and help focus conservation efforts and limited funds on the most vulnerable areas.The Pennsylvania Natural Heritage Program, in cooperation with the Indiana County Planning Commission, has undertaken this project to provide a document and maps that will aid in the identification of these important areas.

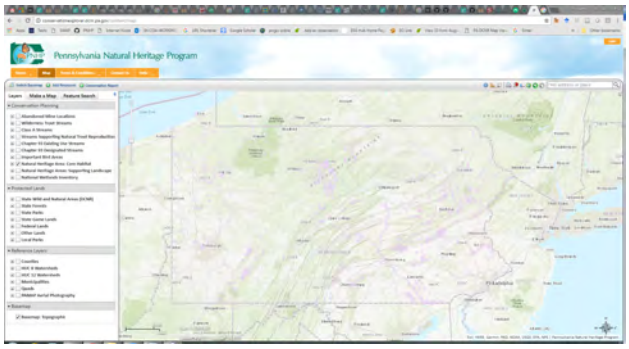
The *Indiana County Natural Heritage Inventory (CNHI) 2021 Update* represents the known species of concern, including plants, animals, and natural communities, in Indiana County. The inventory provides maps of the best natural communities (habitats) and the locations of animal and plant species of concern (rare, threatened, and endangered) in Indiana County. These maps do not pinpoint the exact location of the species of concern but rather represent a conservation zone that is critical to the preservation of the site (Core Habitat) and a surrounding zone of potential impacts (Supporting Landscape), where applicable. In an effort to focus management and preservation efforts in the most critical portions of the habitat of species of concern, PNHP now primarily focuses on Core Habitat in both spatial data and written conservation recommendations. A written description including threats and disturbances, conservation recommendations, and a summary table of the species of concern, including degree of rarity, last-observed date, and quality rank accompany each map. Potential threats and stresses, and suggestions for protection of the rare communities, plants, or animals at the site are included in the individual site descriptions.

The information and maps presented in this report provide a useful guide for planning residential or commercial developments, recreational parks or trails, for conserving natural areas, and for setting priorities for the preservation of the most vulnerable habitats. All of the sites in this report were evaluated for their importance in protecting biological diversity on a state and local level, but many also have scenic value, provide water quality protection, and are potential sites for low-impact passive recreation, nature observation, and/or environmental education.

The Indiana County Natural Heritage Inventory – 2021 Update will be made available to each municipality through the Indiana

County Planning Commission. The Natural Heritage Inventory is a conservation tool meant to aid in the creation of municipal and county comprehensive plans. Its emphasis on biological diversity should inform county and regional open space plans already underway, as well as contribute to updates to those plans already completed. Indiana County, its municipalities, land trusts, and other organizations can also use the Natural Heritage Inventory to identify potential protection projects that may be eligible for funding through state or community grant programs.

Landowners will also find this inventory useful in managing and planning for the use of their land; it gives them the opportunity to explore alternatives that will provide for their needs and still protect the species and habitats that occur on their land. For example, the Forest Stewardship Program, coordinated by the Pennsylvania Department of Conservation and Natural Resource's Bureau of Forestry, assists landowners in creating management plans that incorporate landowner objectives (e.g.,wildlife or timber management). Other programs include the USDA's Forest Legacy Program and the Pennsylvania Department of Agriculture's Agricultural Land Preservation Program. Land managers may wish to consult with this report and the environmental review tool found on the Pennsylvania Natural Heritage Program's website (www.naturalheritage.state.pa.us) in an effort to avoid potential conflicts in areas with species of concern and/or identify ways of enhancing or protecting these resources.



The information depicted in this report is also incorporated into the **Pennsylvania Conservation Explorer** (aka "Explorer"), a web-based interactive application. Explorer allows users to access conservation planning information, including locations of natural heritage areas, protected lands, and high quality streams. Conservation reports can be downloaded for use in local planning or project specific assessments. Through Explorer, users may:

1. Visualize available data about Pennsylvania's natural heritage,
2. Produce conservation planning reports to informally guide projects, or
3. Generate reports to submit as part of a formal Pennsylvania Natural Diversity Inventory (PNDI) environmental project review.

While the first two uses are freely available to anyone interested in exploring the data, the third use is a component of a pre-screening procedure for granting permits to projects, and requires users to log in. Explorer makes available a variety of online video tutorials, and other resources to aid users in maximizing their use of this tool.

Learn more about Pennsylvania Conservation Explorer at https://conservationexplorer.dcnr.pa.gov/

4 BIODIVERSITY IN PENNSYLVANIA

An ecosystem is the combination of a community of organisms and their environment, operating as a system. All the parts of an ecosystem are interconnected, and the survival of any species or the continuation of a given natural process (e.g. decomposition, carbon sequestration, or the filtration of pollutants from surface water) largely depends upon the system as a whole. Conversely, individual species and natural processes contribute towards maintaining the system. An important consideration in assessing overall ecosystem health is the concept of biodiversity. Biodiversity can be defined as the full variety of life that occurs in a given place, and is measured at several scales: genetic diversity within a single species, species diversity, natural communities, and landscapes. We know that biodiversity has a direct connection to ecosystem functioning and a healthy environment (Hooper et al. 2012). And, while there is often not an immediately obvious connection between the loss of an individual species from an ecosystem and the functional health of the ecosystem, there is always the possibility of unexpected or unintended consequences.

Figure 2: *Eastern hellbender is the state amphibian of Pennsylvania. Photographer: Pete Woods, PNHP*

Genetic diversity refers to the variation in genetic makeup between individuals and populations of organisms. A genetically diverse population is more likely to be able to successfully adapt to environmental changes (Jump, Marchant, and Peñuelas 2009). In order to conserve genetic diversity, it is important to maintain individual populations of adequate size, as well as allowing for natural patterns of gene flow between populations through the migration of individual plants and animals across the landscape, as well as the dispersal of pollen and seeds among populations (Bacles 2006). Individual species play a role in sustaining ecosystem processes such as nutrient cycling, decomposition, and plant productivity, because each species interacts with the environment in slightly different ways; declines in native species diversity alter these processes. In Pennsylvania, many populations are at the edge of their range, potentially hosting unique genetic characteristics that could facilitate adaptation to changing climate (Hampe and Petit 2005). For example, southwestern Pennsylvania is the northern extent of the Appalachian region, and we host the farthest north populations of Appalachian species, such as beautiful Barbara's-buttons (*Marshallia pulchra*). Pennsylvania also is the farthest southern reach of many boreal species, such as bog laurel (*Kalmia polifolia*) and breeding populations of blackpoll warbler (*Setophaga striata*).

A natural community is an interactive assemblage of plant and animal species that share a set of similar environmental tolerances or preferences, and occur together repeatedly across the landscape, such as a red maple swamp. Each type of natural community represents habitat for a different assemblage of species and often indicates different environmental characteristics (for example, different natural communities prefer different ranges of moisture, temperature, or soil pH). Identification and stewardship of the full range of native community types is needed to meet the challenge of conserving habitat for all species.

From an ecological perspective, a landscape is a large area of land that includes a mosaic of natural community types and a variety of habitats for many species. At this scale, it is important to consider whether communities and habitats are isolated or connected by corridors of natural landscape traversable by wildlife, and whether the size of a natural landscape is sufficient to support viable populations and ecosystems which will be persistent long-term (Baldwin et al. 2018). Because the living and non-living elements of an ecosystem are interconnected and interdependent, it is essential to conserve native biodiversity at all of these scales, from genes through landscapes.

Pennsylvania's natural heritage is rich in biodiversity and the state includes many examples of high quality natural communities and large expanses of natural landscapes. Over 20,000 species are known to occur in the state, and the extensive tracts of forest in the northern and central parts of the state represent a large portion of the remaining areas of suitable habitat in the mid-Atlantic region for many forest-dependent species of birds and mammals. Unfortunately, biodiversity and ecosystem health are seriously threatened in many parts of the state by pollution and habitat loss. Of all the animals and vascular plants that have been documented in the state, more than one in ten are imperiled; 334 species are considered historic to the state and 139 of these lost entirely since European settlement. 351 are threatened or endangered. Many of these species are imperiled because available habitat has been reduced and/or degraded.

Fifty-six percent of Pennsylvania's wetlands have been lost or substantially degraded by filling, draining, or conversion to ponds.

According to the Pennsylvania Department of Environmental Protection (DEP), 60 percent of Pennsylvania lakes that have been assessed for biological health to date are listed as impaired. Of 83,000 miles of streams in Pennsylvania, almost 70,000 miles have been assessed for water quality. From this, nearly 11,000 miles have been designated as impaired due to abandoned mine discharges, acid precipitation, and agricultural or urban runoff. The species that depend on these habitats are correspondingly under threat: 58 percent of threatened or endangered plant species are wetland or aquatic species; 13 percent of Pennsylvania's 200 native fish species have been lost, while an additional 23 percent are imperiled. Among freshwater mussels, one of the most globally imperiled groups of organisms, 18 of Pennsylvania's 67 native species are extirpated (meaning locally extinct) and another 22 are imperiled.

Prior to European colonization, over 90 percent of Pennsylvania's land area was forested. Native Americans encouraged disturbance regimes, often fire-driven, that created a shifting patchwork of early and later successional areas (Stambaugh et al. 2018), and likely played a large role in facilitating dominance by fire and drought tolerant species like oak (*Quercus*) and chestnut (*Castanea*). European colonization of Pennsylvania, followed by clear-cutting of forests and then fire suppression, dramatically altered the disturabnce regimes on the landscape, as well as the overall landcover. Today, much of our forest has begun to regenerate, with 60 percent forest cover overall, but much of this forest is fragmented by roads, utility rights-of-way, agriculture, and other intensive human developments. There has also been a general shift in Pennsylvania forests towards dominance of tree species that are more shade tolerant and intolerant of fire, like maple (*Acer spp.*) and birch (*Betula spp.*) (Abrams and Nowacki 2019). Only 42 percent of remaining forest is classified as interior forest habitat; meaning that some of the species which are very sensitive to human disturbances and that depend upon these relatively undisturbed forest habitats are in decline. In addition to habitat fragmentation, forest pests, acid precipitation (which causes nutrient leaching and stunted growth), over browsing by deer and the aggressive spread of invasive species also threaten forest ecosystem health.

PENNSYLVANIA
WILDLIFE ACTION PLAN

Conservation Opportunity Area Tool

Do you want to help Pennsylvania's imperiled wildlife but are not sure where to start? The Wildlife Action Plan Conservation Opportunity Area (COA) Tool is just the place! Powered by more than 400,000 Species of Greatest Conservation Need locations, the COA Tool provides species information for your areas of interest. Learn about what species are (or might be) in the area, their habitat preferences, the habitats found in the area, and conservation actions that will benefit the at-risk species. There is also an option to query by county or large watershed. Everyone can play a role in supporting Pennsylvania's wild heritage. Explore an area of your interest today!

https://wildlifeactionmap.pa.gov

The Wildlife Action Plan and COA Tool were developed and are administered by the Pennsylvania Fish and Boat Commission and Pennsylvania Game Commission, with technical support provided by the Pennsylvania Natural Heritage Program and NatureServe.

The Pennsylvania Natural Heritage Program (PNHP) in cooperation with the Pennsylvania Biological Survey (PABS) assesses the conservation status of species of vascular plants, vertebrates, and selected invertebrate groups native to Pennsylvania. While Pennsylvania hosts a diversity of other life forms, far too little information is known about the distribution of mosses, liverworts, lichens, fungi, and most invertebrates to fully assess their conservation status at this time. Despite lacking information about all of these groups of species, it is still possible to protect at least some rare species for which we know little about by conserving rare natural communities. Species tend to occur in specific habitats or natural communities, and by conserving a broad range of examples of all natural community types we will likely also conserve many of the associated species, whether or not we even know what those species are. Thus, the natural community approach is a coarse filter for broad scale biodiversity protection, while the fine filter, species-specific approach is used for those individual species for which it is feasible.

The goals of this report are to identify areas important in sustaining biodiversity at the species, natural community, and landscape levels and to provide that information to more fully inform land use decisions. County Natural Heritage Inventories (CNHIs) identify areas in the state that support Pennsylvania's rare, threatened, or endangered species as well as natural communities that are considered to be rare in the state or exceptional examples of the more common community types. A description of each area's natural features and recommendations for maintaining their viability are provided. Also, in an effort to provide information focused on planning for biodiversity conservation, this report includes lists of all the currently documented rare species and natural communities in the county, references, and links to information on invasive exotic species. Together, with the other land use information, this report can help guide the planning and land management necessary to maintain the ecosystems on which our natural heritage depends.

5 NATURAL HISTORY OVERVIEW OF INDIANA COUNTY

Indiana County has a rich history of mineral extraction, light industry, education, tourism, and agriculture that has dramatically transformed the landscapes and waterways over the last two centuries. Creeks and streams throughout the county drain the plateaus, ultimately ending in the Allegheny River. Forested areas cover over half of the county and are primarily in the mountainous uplands as well as on steep slopes or in valleys that were saved from repeated logging.

Yellow Creek flows through Indiana County. Photo: PNHP

The scenic and natural environments are found in protected parks and conservation lands as well as in the tributaries of and in portions of the Allegheny River that flows through the county. Wise planning will help maintain the remaining natural environments along with the associated plants and animals, while striking a balance between regional growth and preservation of scenic and natural resources in the county.

5.1 Land Cover

The 2016 NLCD land cover (Dewitz 2019) for Indiana County shows that the majority (67.5)%) is forest (Figure 4). Agriculture is the next highest landcover category, making up approximately 21.8% of Indiana County's land area. Although wetlands only make up a small percentage of the county's land area (0.2%), they are important for habitat and water quality.

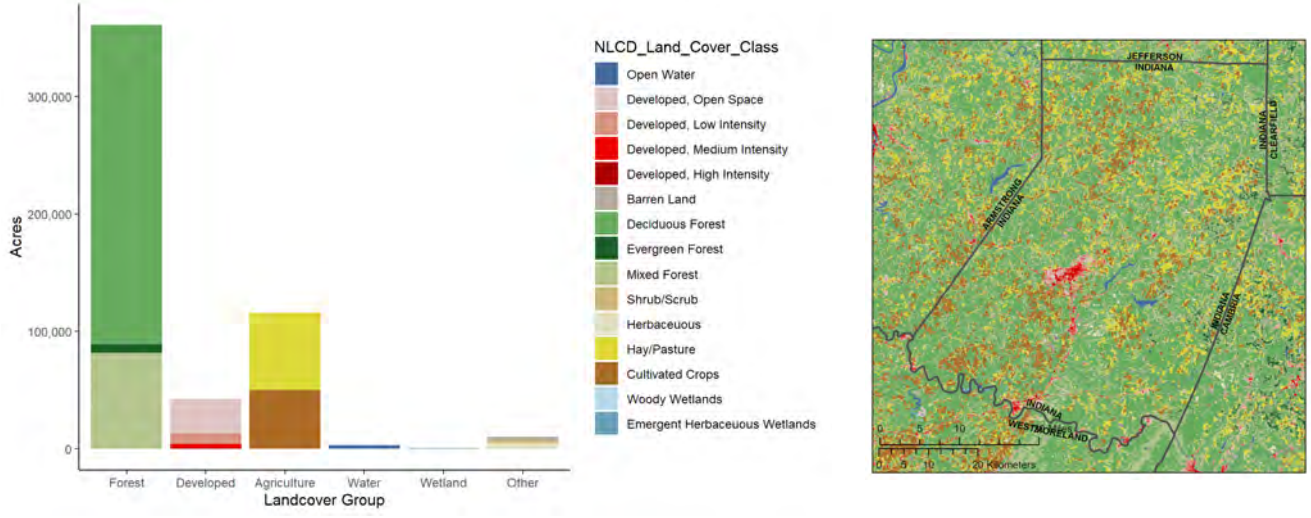


Figure 4: *Land cover distribution for Indiana County.*

5.2 Physiography & Geology

Landscape topography, climate, and distinctive geological formations define Physiographic Provinces (Figure 5). Physiography relates in part to a region's topography and climate. These factors significantly influence soil development, hydrology, and land use patterns of an area. Additionally, both physiography and geology are important to the patterns of plant community distribution, which in turn influence animal distribution. Because of the differences in climate, soils, and moisture regimes, certain plant communities would be expected to occur within some provinces and not in others.

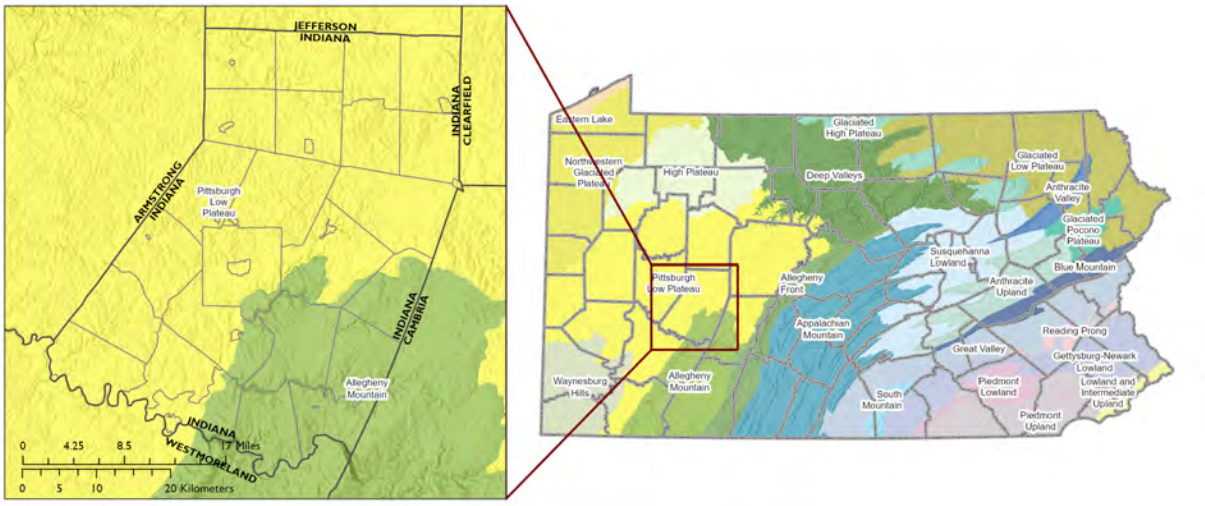


Figure 5: *Physiographic provinces and sections of Indiana County.*

Indiana County lies entirely within the Appalachian Plateaus phsyiographic province. The county is divided among the Pittsburgh Low Plateau (75%) and Allegheny Mountain (25%) physiographic sections. Descriptions of the two physiographic sections are as follows:

- Pittsburgh Low Plateau — The Pittsburgh Low Plateau section of the Appalachian Plateaus province is characterized by smooth to irregular, undulating surface at the tops of the hills with narrow, relatively shallow valleys. Topographic relief is low to moderate. The moderately folded bedrock is composed of shale, siltstone, sandstone, limestone, and coal.
- Allegheny Mountain — The Allegheny Mountain section of the Appalachian Plateaus province is characterized by wide ridges separated by broad valley. The ridge elevation decreases to the north. Topographic relief is moderate to high. The bedrock is composed of sandstone, siltstone, shale, and conglomerate; with some limestone and coal.

5.3 Watersheds

A watershed is defined by the local topography, which dictates which path water will take as it flows towards the lowest point in an area. The water moves through a network of drainage pathways, both underground and on the surface. As you move downstream in a watershed, these pathways converge into streams and rivers, which become progressively larger, eventually reaching the oceans. Every stream, tributary, and river has an associated watershed, with small watersheds merging to become larger watersheds. Watersheds can be classified at large scales, like that of the Conemaugh, or smaller scales, like that of Crooked Creek, but all land is part of a watershed. Approximately 92% of Indiana County is drained throught the Ohio Region basin to the Mississippi River and ultimately to the Gulf of Mexico, whereas, a smaller portion (8%) drains through the Mid Atlantic Region to the Atlantic Ocean (Figure 6).

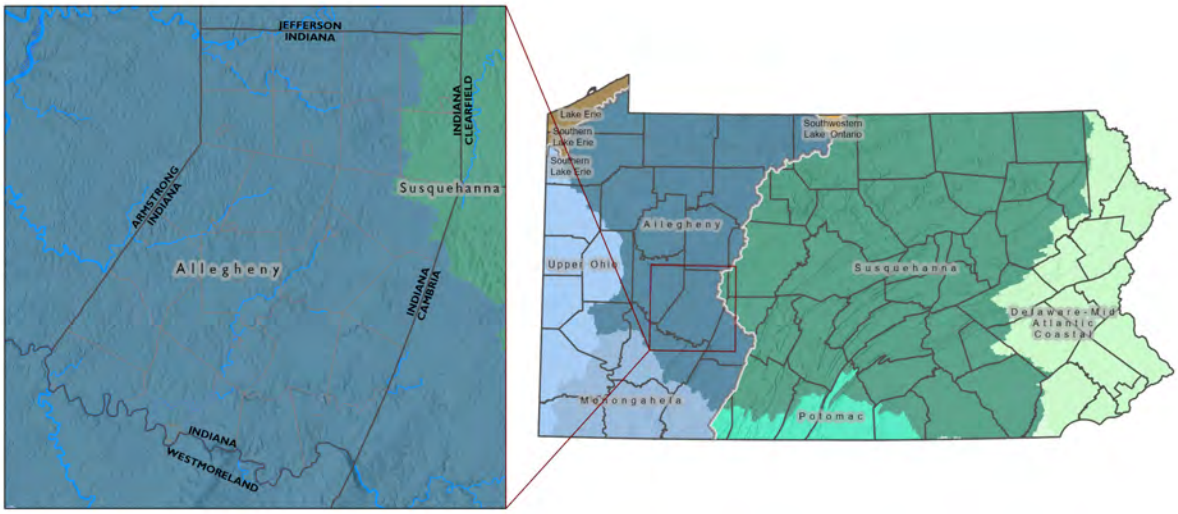


Figure 6: *Watersheds of Indiana County.*

Habitats and natural communities found in different watersheds can be subject to very different conditions, even if they seem spatially quite close together. Using a watershed framework when making environmental decisions makes explicit which parts of the landscape are most directly connected to each other. This is especially true for aquatic systems, but also is helpful in terrestrial systems, particularly when conservation decisions are being made in an effort to reduce soil erosion or flooding, or improve downstream water quality.

The upland and riparian habitats surrounding bodies of water influence the water quality. Thus, a large part of aquatic conservation is focused on conserving adjacent terrestrial and wetland habitats. Floodplains are flat, often flooded, areas along streams and rivers. They are important terrestrial habitat areas tied to the flowing water system. Floodplains are typically inundated by water during the spring runoff and then remain dry after these floodwaters recede. The species which specialize in floodplain habitats are adapted to these stressful conditions. Forested floodplains also serve as a protective buffer against erosion, provide cooling shade to the waterway, filter pollutants and excessive nutrients from runoff, and help alleviate flood damage along many of the area's creeks.

In addition to naturally vegetated floodplains, vegetated riparian buffers along streams and other bodies of water provide vital benefits including protection of water quality, reduced erosion, flood control, and wildlife habitat. Elimination of riparian vegetation removes the capacity of this region to buffer the effects of the surrounding landscape and consequently reduces the water quality in the stream, as well as increasing the risk of flooding to developments near water bodies. Two major negative effects of the loss of riparian buffers are sedimentation and nutrient enrichment. More information about riparian buffer management is available through the PA DCNR website, https://www.dcnr.pa.gov/Conservation/Water/RiparianBuffers/Pages/default.aspx.

Streams and rivers that are dammed are modified habitats compared to waterways that maintain natural flow patterns. Dam-induced changes include increased water temperatures and alterations to the way sediment moves and is distributed in the river, which can impact shoreline and stream bottom habitat. Dams also act as barriers to fish migration. Protecting the quality of surface and groundwater resources from degradation contributes to the future well-being of all plants and animals, including human communities.

5.4 Natural Communities

The interaction of geology and climate produces the pattern of vegetation expressed on the landscape. Plant communities are groups of plants sharing a common environment that interact with each other, animal populations, and the physical environment. Identifying plant communities facilitates the formation of plans for ecosystem stewardship, forestry, and rare species protection, as conservation actions that benefit a plant community as a whole will also generally benefit the individual species within that community. Plant communities are classified by the dominant species, growth form, and ecological habitat characteristics, such as climate, soils, and geology. In the same way plants and animals are tracked by the Pennsylvania Natural Heritage Program, occurrences of rare, high quality natural communities are tracked by the program and are components of Pennsylvania's Environmental Review.

In this report, the discussion of plant communities is divided between terrestrial (upland) communities and palustrine (wetland) communities, following the Pennsylvania Community Classification (see box at right). Riparian communities (plant communities of river floodplains) are included in the palustrine classification, even though they often exhibit characteristics of both upland and wetland, as well ecological processes specific to floodplain ecosystems. Defining the boundaries of plant communities may be tricky. Boundaries between community types range from easily identifiable "hard" boundaries, such as the boundary between a field and forest, to less distinct boundaries, such as a gradual change between two different forest stands within a large forest patch. Using the combination of dominant species, the growth forms of plants, and ecological site characteristics, one can accurately and consistently identify plant communities of the region.

Plant communities are groups of plants sharing a common environment that interact with each other, animal populations, and the physical environment. Plant community surveys provide information about the structure and diversity of the plant species, soil chemistry, geology, potential for wildlife habitat, and quality of the entire landscape. These data can be used to create comprehensive, wide-scale land management and conservation plans.

PNHP's plant community classification system, Terrestrial and Palustrine Plant Communities of Pennsylvania 2nd Ed., includes information on over 100 natural plant communities found in Pennsylvania. Community descriptions include plant species and their associated soil types, geology, related plant communities, and range. Information from the PNHP classification system has been incorporated into NatureServe's National Vegetation Classification and other national projects. The PA Plant Community Classification is a work in progress – PNHP ecologists are always learning new things about our environment – and plant community descriptions are updated with new information from time to time.

Learn more about PNHP's plant community classification and tools to help identify and describe plant communities of interest at https://www.naturalheritage.state.pa.us/Communities.aspx

Indiana County lies within the Mixed Mesophytic Forest Region as described by Braun (1951). Prior to European colonization, the forests were dominated by a variety of species, including beech (*Fagus grandifolia*), tuliptree (*Liriodendron tulipifera*), basswood (*Tilia americana*), sugar maple (*Acer saccharum*), chestnut (*Castanea dentata*), oaks (*Quercus* spp.), and hemlock (*Tsuga canadensis*). Since there are so many canopy species that characterize this forest type, composition of individual forest patches can vary greatly across the landscape.

The landscapes and waterways of Indiana County have undergone considerable change over the course of European colonization, most notably from mining, agriculture, and logging. During the timber boom in the early twentieth century, much of the forest in the county underwent general clear-cutting and subsequent widespread fires. Mining began with deep mine excavation and transitioned to mostly surface mining operations as mining technology developed. Coal mining has been widespread in the county, along with some limestone mining. Agriculture has been extensive in certain parts of the county, resulting in an environmental transformation of a large proportion of the land. Throughout the county, the condition of ecological resources today closely reflects the history of human land use.

Natural communities have now redeveloped across large swaths of the landscape previously used for logging and agriculture. Few large forested blocks remain, but those that do help to maintain water quality in streams and provide habitat for native species of plants and animals. Mountainous uplands and steep ravines hold the largest contiguous blocks of forest in the county, since they are difficult to convert to other uses. Like other areas of Pennsylvania, these forests are composed largely

of second and third growth stands of timber. The understory is often dominated by shrubs from the heath famiy, including blueberries and huckleberries (*Vaccinium* spp.), rhododendron (*Rhododendron maximum*), and mountain laurel (*Kalmia latifolia*). The condition of forest communities varies across the county. While some areas have regenerated into diverse natural forest communities, many areas remain fragmented by roads, artificial clearings, and utility rights-of-way. Additionally, over-browsing by deer is affecting biological diversity and forest regeneration in many regions of the county.

Overall nearly half of the land use in Indiana County is forested and considered natural ecosystems according to the Northeast Terrestrial Habitat Map (Ferree and Anderson 2013). The most commonly encountered forest types in Indiana County are Appalachian (Hemlock)-Northern Hardwood Forest and Northeastern Interior Dry-Mesic Oak Forest. The high and dry slopes in the county are typically dominated by oaks, red maple (*Acer rubrum*), pitch pine (*Pinus rigida*), white pine (*Pinus strobus*), black gum (*Nyssa sylvatica*), sassafras (*Sassafras albidum*), and birch. These forests often exhibit a dense layer of blueberries, huckleberries, and mountain laurel (*Kalmia latifolia*). Forests on the slopes and in ravines are dominated by tuliptree, red oak, red and sugar maple, basswood, beech, and hemlock. Ash trees (*Fraxinus spp.*) were once a co-dominant species in these forests and have all but disappeared due to the invasion of emerald ash borer resulting in the death of most ash trees in the county.

An eastern hemlock lined stream in Indiana County. *Photo: Chris Tracey, PNHP*

Other forest communities found in Indiana County include a South-Central Interior Mesophytic Forest and Southern and Central Appalachia Cove Forest typically found on cool, moist slopes which provide suitable conditions for eastern hemlock, maple, beech, tulip tree, and birch species. North-Central Interior Floodplain Forests are situated in bottomlands along the rivers and streams where mesic, rich, alluvial soils. These locations are periodically inundated by floodwaters resulting from spring runoff and intense storm events. Species such as sycamore (*Platanus occidentalis*), silver maple (*Acer saccharinum*), common cottonwood (*Populus deltoides*), box elder (*Acer negundo*), and black willow (*Salix nigra*) are adapted to tolerate the dynamic floodplain forest conditions.

In addition to the forests, other natural communities in the county include, riverine (streams), lacustrine (large ponds lakes), palustrine (wetlands), and grasslands. Many of the wetlands in Indiana County are associated with streams and include floodplain forests, forested swamps, shrub swamps, and graminoid marshes. Wetlands are relatively rare throughout much of Pennsylvania, and are an important refuge for plants and provide important habitat for nesting and migrating birds. Many other animal groups such as amphibians, reptiles, dragonflies, damselflies, moths, and butterflies also depend on specific wetland habitats for all or a portion of their life cycles.

Graminoid marshes are wetlands dominated by plants such as cattails (*Typha latifolia*), sedges (*Carex spp.*), and grasses. These wetlands may be found in association with streams or in areas with ground water seepages. Graminoid marshes in the county are frequently formed as successional communities following the creation of beaver dams or other impoundments or can be found along the edges of reservoirs. These wetlands are frequently rich in species diversity and provide important breeding habitat for numerous amphibians, reptiles, invertebrates, and birds.

Vernal pools, also known as seasonal/ephemeral or fluctuating ponds, are wetlands that fill annually from precipitation, surface runoff, and rising groundwater (Kenney and Burne 2000). Vernal pools in Indiana County typically occur along streams. The pools typically become completely dry, through evaporation, by late spring or early summer. Since these ponds dry up, they cannot support fish populations. During the brief window when the pools contain water, they serve as important breeding grounds for a multitude of amphibian species (e.g. salamanders and frogs), many of which breed solely in these areas due to the absence of fish.

In addition to naturally vegetated floodplains and vegetated riparian buffers along streams and other bodies of water, flowing water forms aquatic systems of great diversity in Indiana County. Flowing water systems begin as high mountain brooks which form from surface runoff, springs, and seeps. These unite to become the headwaters of stream systems lower in the watershed. These mountain waters serve as a home to numerous organisms, from tiny diatoms and algae to insects that provide food for small fish and salamanders. As the mountain brooks coalesce into streams and creeks, they form larger aquatic systems

that have a diversity of microhabitats that support a large diversity of stream-dwelling organisms within two major stream habitats□ riffles and pools. Riffles are shallow, fast-flowing, well-aerated rapids over rocky sections of the stream bottom. These riffles support a diverse animal community including insects, crustaceans, and fish. Interspersed between riffle sections are pools. These are quiet, deeper water habitats that tend to support a less diverse stream biota. The stream systems, in turn, feed into larger flowing water systems such as the Allegheny, West Branch of Susquehanna, and Conemaugh Rivers.

The natural communities in Indiana County vary in size, number, and quality. The highest quality forest communities have large trees, a well-developed understory, a diversity of spring wildflowers, and minimal invasive species. Some of these forests may also contain vernal pools or other wetland types making them priority targets for conservation. Likewise, headwater wetlands, vegetated riparian buffers, and scour grasslands are important for a vast number of wildlife species and need protection from disturbances and land use changes. Land trusts, conservation groups, and local and state agencies play crucial and important roles in protecting the natural heritage of Indiana County for the enjoyment of future generations.

5.5 Regional Disturbances

Disturbances, whether natural or man-made, have played a key role in shaping many of the region's natural communities and their associated species. The frequency and scale of these disturbances is formative in the appearance of natural communities today. In general, natural communities will be more resilient to disturbances when landscape connectivity is high and communities are still relatively intact and unfragmented. This allows for disturbed communities to be recolonized by individuals from nearby undisturbed patches in the landscape.

Natural Disturbances — Natural disturbances, such as fire and flooding, can actually benefit certain natural communities and species. Periodic fires are needed to maintain grassland openings, allow new growth of the characteristic species, and keep out other later-successional species. The forests encountered in Pennsylvania by the first European colonists experienced frequent cycles of fire, encouraged in part by Native American land management practices. Thus many of the "pristine" or historic ecosystem conditions that we recognize in this region are in part the product of a consistent history of human intervention. Another example of an ecosystem shaped by consistent disturbances are floodplain forests. The structure of these forest communities are the result of periodic scouring and deposition of sediments as streams overtop their banks, which facilitates species which are tolerant of these types of disturbance cycles, such as silver maple (*Acer saccharinum*), sycamore (*Platanus occidentalis*), or willows (*Salix spp.*). In the absence of regular flooding, these floodplain communities would not be able to persist.

Figure 8: *Abandoned mine drainage (AMD) is polluted water that leaches out of mines, often turning streams a characteristic orange color from iron oxides. Photographer: PNHP*

Over-browsing by deer is another natural disturbance which can have detrimental effects on natural communities and species (Latham et al. 2005). Excessive deer browse can remove the understory of some forests and halt regeneration of the canopy and understory by preferential feeding. Deer feeding preferences can have a direct effect on rare plants and severely decrease essential habitat for other animal species. Over-browsing can result in a lack of forest regeneration, a reduction in the diversity and density of forest understory, a decrease in songbird diversity and direct loss of rare plants (Beguin et al. 2016).

Human Disturbances — Humans function as ecosystem engineers, altering the landscape around us to suit our needs. Some species benefit from human-induced changes, such as birds that inhabit the early successional and edge habitats created by utility corridors, or disturbance-adapted plants that colonize roadsides; however, as is more often the case, species with specific habitat requirements suffer declines when faced with human encroachment. Given the pervasiveness of human influence throughout the northeastern United States, the ecological importance of large areas of relatively unfragmented and undisturbed habitat cannot be overestimated. Not only are these areas potential habitat for a number of sensitive species, but they are also important for the maintenance of vital ecosystem processes and services such as nutrient cycling, pollination, and predator-prey interactions. Additionally, large forested areas also serve to filter and regulate the flows of streams within watersheds and store large quantities of carbon as biomass. While human disturbances are semi-permanent parts of the landscape, decisions about the type, timing, location, and extent of future disturbances can have a strong influence on the natural ecological diversity that remains for future generations. Careful land use planning can protect the most sensitive ecological

areas from disturbance and also allow working landscapes to continue to support biodiversity while also fulfilling societal needs.

5.6 Forest Fragmentation

Prior to European colonization, the vast majority of the area that became Pennsylvania was forested (J. R. Thompson et al. 2013). Today, just 62 percent of the state is forested (Figure 9), comprising an area of approximately 17 million acres (Albright 2017). Figure 9 shows the division of these forests by fragmenting features such as interstate highways, major rivers, local roads, utility rights-of-way, all-terrain vehicle trails, snowmobile trails, railroads, and patches of non-forested lands. Much of this forest exists as relatively small islands isolated by these surrounding linear features.

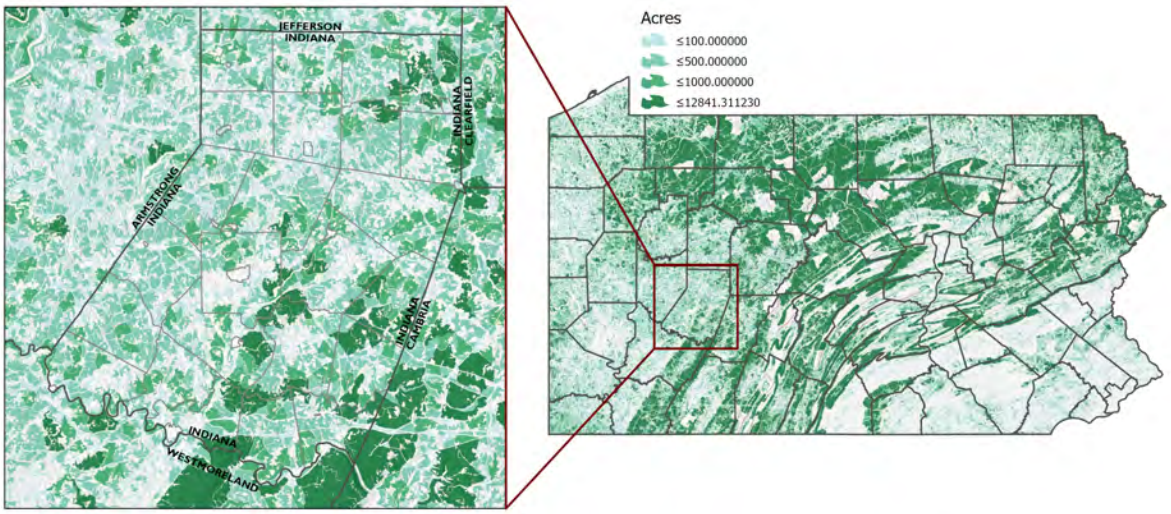


Figure 9: *Forest patches of Indiana County.*

Loss of forest habitat, as well as fragmentation of contiguous forested landscapes into smaller, isolated tracts has an effect on plant and animal distribution and community composition. When a large piece of forest tract is fragmented, or split into pieces, the resulting forest islands may lack some of the habitats that existed in the original tract, or may be smaller than the minimum area required by a given species (Lynch and Whigham 1984; Trzcinski, Fahrig, and Merriam 1999). For example, the Louisiana waterthrush (*Parkesia motacilla*) is rarely found in small woodlots because they require upland forest streams within their territory and most small woodlots lack this necessary component (Robinson et al. 1995). Area-sensitive species such as the northern goshawk (*Accipiter gentilis*), barred owl (*Strix varia*), bobcat (*Lynx rufus*), and timber rattlesnake (*Crotalus horridus*) require interior forest areas in excess of 6,000 acres to accommodate breeding and foraging territories (Mazur and James 2000; Squires and Reynolds 1997; Ciszek 2002).

Edge forest is composed of a zone of altered microclimate and contrasting community structure distinct from the interior,or core forest (Matlack 1993). Along with a reduction in total forested area, forest fragmentation creates a suite of edge effects which can extend 1,000 feet into the remaining fragment (Richard TT Forman and Deblinger 2000). Edge effects include increased light intensity, reduced depth of the leaf-litter layer, altered plant and insect abundance, and reduced numbers and species diversity of macroinvertebrates (Watkins et al. 2003; Yahner 2000; Haskell 2000). The macroinvertebrates in the leaf litter are significant for the pivotal role they play in energy and nutrient cycling; these macroinvertebrates also provide an important food source for salamanders and ground-feeding birds (Voshell 2002). Additionally, a number of studies have shown that the nesting success of forest-interior songbirds is lower near forest edges than in the interior, due to increased densities of nest predators and brood parasites.

Not only do roads fragment forests, but roads can also act as corridors for dispersal of invasive plants and toxic chemicals, and pollute nearby aquatic systems. Vehicles can transport exotic plant seeds into previously un-infested areas, while road construction and maintenance operations provide sites for seed germination and seedling establishment (Schmidt 1989; Trombulak and Frissell 2000). Road traffic and maintenance of rights-of-way also contribute to the introduction of at least six different groups of chemicals into the environment: heavy metals, salt, organic pollutants, ozone, nutrients, and herbicides (Richard TT Forman and Alexander 1998; Trombulak and Frissell 2000). Heavy metals such as lead, aluminum, and iron contaminate soils, plants, invertebrates, and vertebrates up to 656 feet from roads (Trombulak and Frissell 2000). Deicing salts alter the soil's chemical composition (including the pH), which affects plant growth. Airborne sodium chloride from snowplowing may cause leaf injury to trees up to almost 400 feet from a road (Richard TT Forman and Alexander 1998). Organic pollutants such as dioxins and polychlorinated biphenyls (PCBs) are present in higher concentrations along roads, and hydrocarbons may

accumulate in aquatic ecosystems near roads. Storm runoff from roads, particularly where roads abut or cross water bodies, can result in the transportation of nutrients and sediments into aquatic ecosystems. Drifting or misused herbicides applied to roadsides and utility rights-of-ways to control woody plant growth may damage forest edge and interior plant species or directly kill rare plants.

5.7 Invasive Species

The introduction of non-native species into Pennsylvania began with the initial introduction of Europeans in the 17th century (S. A. Thompson 2002) and continues today. Plants and animals have been deliberately introduced for a variety of purposes including food sources, erosion control, landscaping, and game for hunting and fishing. Other species have been accidentally introduced as 'stowaways' through increases in global trade and transportation. These introductions have had drastic effects on Pennsylvania's biodiversity over time. For example, over 37% of the plant species now found in the state did not occur here during the first period of European settlement (S. A. Thompson 2002). While many introduced species do not spread aggressively or have strong influences on native species, a subset of introduced species—those classified as "invasive"—have a variety of negative impacts on native species and natural communities. As a standard definition, an invasive species is one that is non-native to an area and is known to cause harm to the environment, economy, and/or human health.

The mission of the Pennsylvania iMapInvasives program is to support the work of natural resource professionals, citizen scientists, and land owners by providing a free-to-use online platform where invasive species sightings and management efforts can be recorded and shared. All records submitted to the iMapInvasives database are vetted by trusted experts for species identification and mapping location accuracy prior to being confirmed in the database.

The iMapInvasives program works with non-profit groups, state and federal agencies, academia, and many others to compile information on aquatic and terrestrial plants, animals, and insects by documenting where they occur and efforts to manage them. This information is then available for use by countless individuals and organizations to prioritize invasive species control projects.

Sign up for your free iMapInvasives user account today by going to https://www.paimapinvasives.org and clicking on the "Login" button.

5.7.1 Invasive Plants

Invasive plants reproduce rapidly, spread quickly over the landscape, and have few, if any, natural controls such as herbivores and diseases to keep them in check (Table 1). Invasive plants typically have a number of characteristics that allow them to spread rapidly and make them difficult to remove or control: 1) Spreading aggressively by runners or underground roots; 2) Producing large numbers of seeds that survive to germinate; 3) Dispersing seeds away from the parent plant through various means such as wind, water, wildlife, and people. Invasive plants are capable of displacing native plants from natural communities, especially those with rare, vulnerable, or limited populations. This initial impact is worsened by the tendency for native wildlife to prefer native species over invasive species for food. In some cases, a switch to the invasive plant food supply may affect the physiology of the prey species. For example, many invasive shrubs, such as non-native bush honeysuckles (*Lonicera* spp.), provide fruits that native birds find attractive, yet these fruits do not provide the nutrition and high-fat content the birds need in their diets (Swearingen et al. 2002). Aggressive invasive plants can also transform a diverse small-scale ecosystem, such as a wetland or meadow, into a monoculture of a single species, drastically reducing the overall plant richness of an area and limiting its ecological value. The decrease in plant biodiversity can, in turn, impact the mammals, birds, and insects in an area, as the invasive plants do not provide the same food and cover value as the natural native plant species did (Swearingen et al. 2002). In southwestern Pennsylvania, there are a number of particularly problematic invasive plants:

- Kudzu (*Pueraria spp.*), waterthyme (*Hydrilla verticillata*), and purple loosestrife (*Lythrum salicaria*) are all considered noxious weeds.
- Some invasive plants have negative health consequences for humans, such as Japanese barberry (*Berberis thunbergii*), which harbors ticks (Williams, Linske, and Ward 2017), and poison hemlock (*Conium maculatum*) which can cause skin rashes and is also toxic if ingested.
- There are a number of invasive plants which are considered early-identification species; that is, they are only beginning to be a problem in Pennsylvania. These include Carolina fanwort (*Cabomba caroliniana*), Japanese angelica tree (*Aralia elata*), sawtooth oak (*Quercus acutissima*), and wisteria (*Wisteria floribunda, Wisteria sinensis*).

5.7.2 Invasive Animal Species

In addition to invasive plants, Pennsylvania is now home to several exotic species of animals including mammals, birds, fish, and reptiles along with a suite of invertebrates, fungi, and bacteria. These species can directly threaten populations of native

animals through direct competition or predation. Other invasive exotic animals can alter habitats and ecosystems by changing plant cover or diversity.

- Chestnut blight (*Cryphonectria parasitica*), a fungus, was probably introduced to North America from infected nursery stock from China in the 1890s. First detected in New York City in 1904, it has all but wiped out the American chestnut (*Castanea dentata*) from Maine to Alabama to the Mississippi River. American chestnut once comprised one-fourth to one-half of eastern U.S. forests and was prized as a food for humans, livestock, and wildlife and for its beautiful and durable wood. Today, only stump sprouts from killed trees remain and the canopy composition has been filled by the chestnut's associate species of oaks and hickories.
- Emerald ash borer (*Agrilus planipennis*) is a beetle that kills all species of ash trees (*Fraxinus* spp.). Accidentally introduced into North America from Asia in 2002, it was first detected in Pennsylvania in 2007 in Indiana County and has spread rapidly across the state since then. It is expected that in coming years ash trees will be functionally extirpated in Pennsylvania.
- Another introduced tree-killing species is the hemlock woolly adelgid (*Adelges tsugae*). This is a small aphid-like insect that feeds on the leaves of eastern hemlock trees (*Tsuga canadensis*). Infestations of the woolly adelgid appear as whitish fluffy clumps of feeding adults and eggs along the underside of the branch tips of the hemlock. Hemlock decline and mortality typically occurs within four to ten years of initial infestation. The adelgid can cause up to 90% mortality in eastern hemlocks, which are important for shading trout streams, and provide habitat for about 90 species of birds and mammals, some exclusively, in addition to having cultural value by virtue of being the Pennsylvania state tree. Several control options are currently being tested, but these have met with very limited success. The hemlock woolly adelgid is currently distributed from Maine to Georgia and can be found in most of the counties in Pennsylvania (DCNR 2018).
- The gypsy moth (*Lymantria dispar*) has caused extensive defoliation of forests in the northeast. This European moth was intentionally introduced to the U.S. in 1869 as part of a failed commercial silk production venture. Its main impact is that it defoliates trees, concentrating on oak species, but opportunistically eating almost any type of plant. This defoliation can result in a reduction in the growth rate and eventual death of afflicted trees.
- Several invasive animal species are spreading throughout the streams, rivers, and lakes of Pennsylvania, but in many cases the impact of these species remains unknown. The zebra mussel (*Dreissena polymorpha*) was accidentally introduced to the Great Lakes in the 1980s and has been spreading in Pennsylvania's waters. This mussel poses a great threat to industry, recreation, and native fish and mussel species and should be controlled wherever it occurs. Another non-native bivalve, the Asian clam (*Corbicula fluminea*), has spread throughout most of Pennsylvania's waterways including the Susquehanna and its tributaries. Of greatest concern to biodiversity is the capacity of the clam to alter the ecology of aquatic systems, making it less hospitable to the native assemblage of freshwater mussels, fish, invertebrates, and plants.
- Another aquatic species found in the region, the rusty crayfish (*Orconectes rusticus*), has been transplanted from its native range in the midwestern United States to many of Pennsylvania's watersheds in the form of live fishing bait, even though it is prohibited from transport by the state. Potentially, rusty crayfish can reproduce in large numbers and reduce lake and stream vegetation, depriving native fish and their prey of cover and food. Their size and aggressive nature keep many fish species from feeding on them. Rusty crayfish may also reduce native crayfish, freshwater mussels, and reptile and amphibian populations by out-competing them for food and habitat or by preying directly on young individuals.

5.7.3 Overall Invasive Species Recommendations

The spread of invasive species within the region presents a significant hurdle to the reestablishment of native plants and animals. Additionally, new invasive species continue to be introduced, further degrading natural habitat and displacing native species. This continuous disturbance from invasive species mandates their active management for any native vegetation restoration plan to be successful. Successful control of invasive species is a time-, labor-, and resource-intensive process, but it is also necessary in order to protect and preserve areas where native species are present and providing essential ecological services. Prevention or control during the early stages of an infestation is the best strategy. In areas where invasive plants are well established, multiple control strategies and follow-up treatments may be necessary. After the infestation has been eliminated, regular "maintenance" of the site to prevent a new infestation may also be needed. Specific treatment depends on the target species' biological characteristics and population size. Invasive plants can be controlled using biological, mechanical,and/or chemical methods.

Figure 10: *Spotted lanternfly, a rapidly spreading invasive insect in southwestern Pennsylvania. Photographer: MTSOfan, Creative Commons*

6 METHODS

The following are an overview of the general methods used to create this Natural Heritage Inventory. For more detail about any of these methods, please contact the Pennsylvania Natural Heritage Program.

6.1 Field Work and Data Management

Inventory data comes from a variety of sources. PNHP biologists and data managers work with records of species occurrences, collected from museums, citizen science databases, and various partners and contractors. These occurrences are verified by expert biologists on staff, and in some cases followed up with for additional fieldwork. PNHP biologists also plan de-novo surveys to locations that have the potential to host rare species. PNHP works directly with landowners and other knowledgable stakeholders to define the boundaries of habitat, ascertain land use history, and develop an understanding of conservation threats and concerns for each occurrence. All of this information is stored in a GIS-based database known as "Biotics", which allows PNHP to track how populations fare over time, and note changes in status and quality of habitat. To learn more about PNHP methodology for data collection and management, visit our website: https://www.naturalheritage.state.pa.us/methodology.aspx.

6.2 Natural Heritage Area Mapping

A Natural Heritage Area (NHA) is an area containing one or more plant or animal species of concern at state or federal levels, exemplary natural communities, or exceptional native biological diversity. NHAs include both the immediate habitat and surrounding lands important in the support of these elements. They are mapped according to their sensitivity to human activities, with designations of Core Habitat and Supporting Landscape areas. The sensitivity of each designation varies significantly according to the particular plant, animal, or natural community habitat that the area represents and is discussed in detail in each NHA Site Description.

We consider a Natural Heritage Area to consist of two parts: 1) Spatial data that delineates the site; and 2) a site account with descriptive information about the site.

Core Habitat is defined as the area representing critical habitat that cannot absorb significant levels of activity without substantial negative impacts to elements of concern. The Supporting Landscape is defined as an area directly connected to Core Habitat that maintains vital ecological processes and/or secondary habitat that may be able to withstand some lower level of activity without substantial negative impacts to elements of concern. In recent years, PNHP has moved away from emphasizing Supporting Landscapes, which are often quite large and not as straightforward to include in conservation planning efforts as Core Habitat. In most cases, the Supporting Landscape is not drawn in the NHA maps included with the reports. Supporting landscapes associated with the NHA's can be viewed, however, in the online Conservation Explorer mapping tool: http://conservationexplorer.dcnr.pa.gov/content/map.

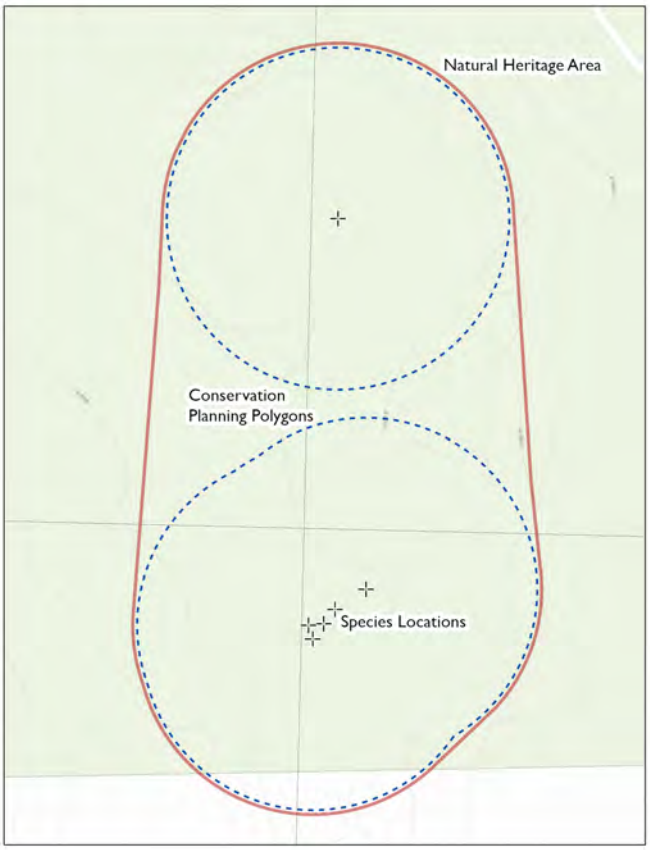


Figure 11: *Definition of an Natural Heritage Area*

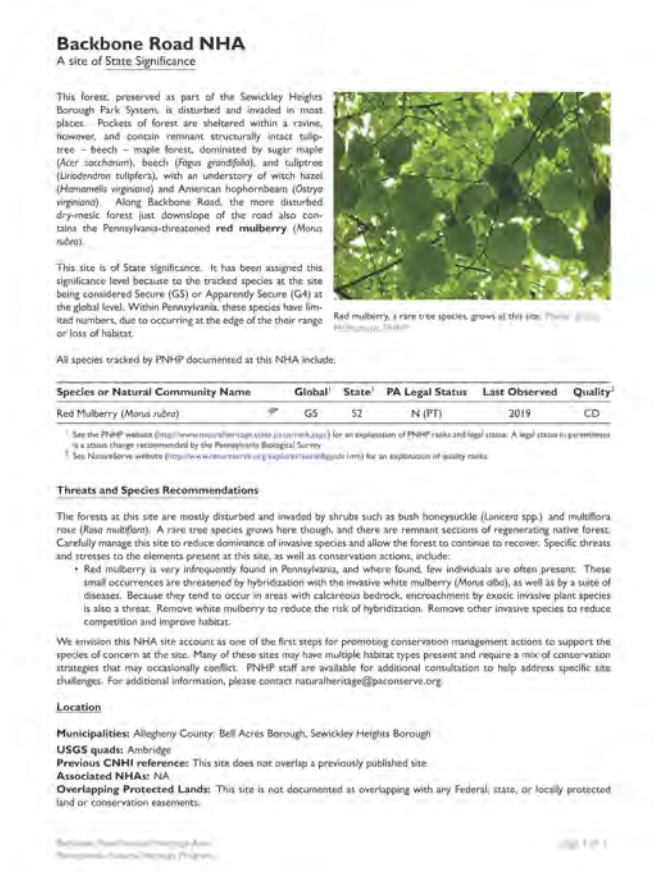
Data obtained on species of concern and natural communities during the field work for this inventory was combined with existing data on species of concern and exemplary natural communities in the PNHP database back to 50 years before present and summarized. Plant and animal nomenclatures follow those adopted by the Pennsylvania Biological Survey. Natural community descriptions follow Zimmerman et al. (2012), which is a revision of Fike (1993). All sites with rare species and/or natural communities were selected for inclusion in Natural Heritage Areas.

Spatial data on the elements of concern were compiled in a Geographic Information System (Esri ArcGIS Pro). Boundaries defining Core Habitat and Supporting Landscapes for each species or community of concern were delineated using PNHP

specifications for Conservation Planning Polygons (CPPs) for the elements of concern (Figure 11). These specifications are based on scientific literature and expert knowledge for individual species or animal assemblages and may incorporate physical factors (e.g., slope, aspect, hydrology); ecological factors (e.g., species composition, disturbance regime); or input provided by jurisdictional government agencies. Core Habitat and Supporting Landscapes for each NHA are then delineated based on the CPPs. NHAs may represent a combination of CPPs for multiple species and populations or they may represent critical habitat defined by a CPP for just one element of biodiversity. NHAs are mapped without regard to political boundaries, and can extend across property boundaries onto un-surveyed lands, when likely-suitable habitat for species is contiguous with surveyed areas. NHA boundaries vary in size and extent depending on the physical characteristics of a given site and the ecological requirements of its unique natural elements. For instance, two Core Habitat wetlands of the same size occurring in the same region may require Supporting Landscape areas of very different size and shape to support their functions if one receives mostly ground water and the other receives mostly surface water, or if one supports a plant species of concern, while the other supports a bird species of concern. Each NHA is then assigned a significance rank—ranging from local to state to regional to global significance—based on its importance, ecological integrity, and contribution to biological diversity across the state. These ranks can be used to help prioritize future conservation efforts.

6.3 Site Accounts

For each NHA, we have developed a written account (Figure 12) that describes the site, outlines conservation priorities, and recommends conservation actions for each NHA. Each site account includes lists the species tracked by PNHP documented at that site. This table includes the species common and scientific names. A species listed as a "Sensitive Species of Concern" is unnamed by request of the jurisdictional agency responsible for its protection, due to factors such as illegal collection, intentional destruction, or potential to be disturbed by people. Additional information noted in the table includes PNHP element ranks, State Status, quality rank and the last year this species was officially observed (see below). Conservation Rank information is also presented in tables for each NHA and a basic of overview of field values is presented below.



Backbone Road NHA

A site of State Significance

This forest, preserved as part of the Sewickley Heights Borough Park System, is disturbed and invaded in most places. Pockets of forest are sheltered within a ravine, however, and contain remnant structurally intact tulip-tree – beech – maple forest, dominated by sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), and tuliptree (*Liriodendron tulipfera*), with an understory of witch hazel (*Hamamelis virginiana*) and American hophornbeam (*Ostrya virginiana*). Along Backbone Road, the more disturbed dry-mesic forest just downslope of the road also contains the Pennsylvania-threatened **red mulberry** (*Morus rubra*).

This site is of State significance. It has been assigned this significance level because of the tracked species at the site being considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of the their range or loss of habitat.

Red mulberry, a rare tree species, grows at this site.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status	Last Observed	Quality[2]
Red Mulberry (*Morus rubra*)	G5	S2	N (PT)	2019	CD

[1] See the PNHP website (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. A legal status in parentheses is a status change recommended by the Pennsylvania Biological Survey.
[2] See NatureServe website (http://www.natureserve.org/explorer/ranking.htm) for an explanation of quality ranks.

Threats and Species Recommendations

The forests at this site are mostly disturbed and invaded by shrubs such as bush honeysuckle (*Lonicera* spp.) and multiflora rose (*Rosa multiflora*). A rare tree species grows here though, and there are remnant sections of regenerating native forest. Carefully manage this site to reduce dominance of invasive species and allow the forest to continue to recover. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Red mulberry is very infrequently found in Pennsylvania, and where found, few individuals are often present. These small occurrences are threatened by hybridization with the invasive white mulberry (*Morus alba*), as well as by a suite of diseases. Because they tend to occur in areas with calcareous bedrock, encroachment by exotic invasive plant species is also a threat. Remove white mulberry to reduce the risk of hybridization. Remove other invasive species to reduce competition and improve habitat.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Allegheny County: Bell Acres Borough, Sewickley Heights Borough
USGS quads: Ambridge
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: NA
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.

Figure 12: *Example of an Natural Heritage Area site account.*

Site accounts are designed to be shared with interested individuals and potential users, and are available to the public via Pennsylvania Conservation Explorer available through http://www.naturalheritage.state.pa.us/.

6.3.1 PNHP Element Ranks

Determining which species and ecosystems are thriving and which are rare or declining is crucial for targeting conservation efforts toward elements of biodiversity in greatest need. NatureServe and its member programs use a suite of factors to assess the conservation status of plant and animal species, as well as ecological communities and systems. These assessments lead to the designation of a PNHP element rank. For species, these ranks provide an estimate of extinction risk, and for ecological communities and systems they provide an estimate of the risk of elimination. The decisions regarding PNHP rank and status are made by a state-recognized panel of experts of the Pennsylvania Biological Survey, following NatureServe guidelines. The PNHP element rank of each species or ecosystem is identified by a number (ranging from 1 to 5) or letter (Table 1) proceeded by a letter reflecting the appropriate geographic scale of the assessment.

For example, G1 would indicate that a species is critically imperiled across its entire range (i.e., globally). In this example, the species as a whole is regarded as being at very high risk of extinction. A rank of S3 would indicate the species is vulnerable and at moderate risk within a particular state or province, even though it may be more secure elsewhere. Other variants and qualifiers are used to add information or indicate any range of uncertainty. Additional information regarding PNHP element rank defini-

Table 1: *Quality Ranks. G = Global and S = Subnational/State*

G/S Ranks	Description
G1/S1	Critically Imperiled — at very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2/S2	Imperiled — at high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors.
G3/S3	Vulnerable — at moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors.
G4/S4	Apparently Secure — uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5/S5	Secure — common; widespread and abundant.
GH/S5	Possibly extinct or extirpated — known only from historical records but there is a chance they may still exist.
GX/SX	Presumed extinct or extirpated — no expectation that they still survive.

tions, as well as complete descriptions of ranks and qualifiers can be found at http://www.naturalheritage.state.pa.us/rank.aspx or http://www.natureserve.org/explorer/eorankguide.htm.

PNHP typically tracks all species ranked S1-S3 in Pennsylvania. Some less-rare species are also tracked if they are thought to be of conservation concern. Still other species which are not currently tracked are actually rare, but due to a lack of scientific information, they are not yet ranked and recognized as rare.

6.3.2 Federal and State Status

Federally listed species are under the jurisdiction of the US Fish and Wildlife Service and have the status definition as described in Table 2. Please refer to http://www.naturalheritage.state.pa.us/RankStatusDef.aspx for a precise and expanded list of Federal and State Status definitions.

Table 2: *Federal legal status.*

Federal Legal Status	Description
LE	Listed Endangered — a species which is in danger of extinction throughout all or a significant portion of its range.
LT	Listed Threatened — any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

The three state jurisdictional agencies (DCNR, PGC, and PFBC) each have slightly different definitions that define status ranks of species under their jurisdiction. Therefore, for the purposes of this report, the following general definitions presented in Table 3 are used to indicate the degree of rarity of each species.

Table 3: *Pennsylvania Legal Status.*

PA Legal Status	Description
PE	Pennsylvania Endangered — species in imminent danger of extinction or extirpation throughout their range in Pennsylvania if the deleterious factors affecting them continue to operate.
PT	Pennsylvania Threatened — species that may become endangered within the foreseeable future throughout their range in Pennsylvania unless the casual factors affecting the organism are abated.
N	No Status — no current legal status, but the species is under study for listing consideration in the future.

Please refer to http://www.naturalheritage.state.pa.us/rank.aspx for a precise and expanded list of Federal and State Status definitions.

6.3.3 Quality Ranks

Each population of a species of concern is assigned a quality rank, based on the estimated probability that it will persist over time at the site. The most commonly assigned ranks are summarized in Table 4.

Table 4: *Quality Ranks.*

Quality Rank	Description
A	Excellent Viability — very likely to persist for 20-30 years in current condition or better.
B	Good Viability — likely to persist for 20-30 years in current condition or better.
C	Fair Viability — persistence uncertain, or decline in condition likely over 20-30 years.
D	Poor Viability — very high risk of extirpation.
E	Verified Extant — recently verified as still existing, but without enough information to estimate viability.
H	Historical — recent field information is lacking, but might still be present.
F	Failed to Find — recent field surveys have failed to locate the species, but habitat still exists and there is a possibility of persistence.
X	Extirpated –surveys demonstrate persuasively that the species is no longer present.

Combination ranks (such as AB or CD) are used to indicate a range of uncertainty associated with a population's viability. Please refer to http://www.natureserve.org/explorer/eorankguide.htm for expanded definitions and application of quality ranks.

6.4 Site Ranking

Each Natural Heritage Area is assigned a significance rank that represents the site's biodiversity importance. Ranks are calculated by a score that represents the G-ranks and S-ranks of each species present at the site, weighted by the Quality ranks for those populations. These scores are summed for each site to produce an overall site score. These scores were used to guide the ranking of the site by expert review. Site scores are assigned categorical ranks based on score thresholds and criteria defined by PNHP biologists (Table 5).

Table 5: *Natural Heritage Area significance ranks.*

Rank	Description
Global	Sites which have global importance for biological diversity and Pennsylvania hasa primary role to maintain (e.g.,most of the known occurrences are within Pennsylvania). Sites in this category generally contain one or more occurrences of species of global concern (e.g.,G2and G1) or large concentrations of species of lower significance.
Regional	Sites which have regional importance for biological diversity and these Pennsylvania sites are important for maintaining representation of those species in the greater Northeast /mid-Atlantic region. Sites in this category generally contain one or more occurrences of species of global concern (e.g., G3) or concentrations of species of lower significance.
State	Sites which are important for the biological diversity and ecological integrity at the state scale. Sites have occurrences of elements of concern with lower ranks (G and S rank see above), smaller populations or extent, or generally lower biodiversity scores than Global or Regional ranked areas.
Local	Sites which have importance to biological diversity at the county scale, but are not, as yet,known to contain species of concern or state significant natural communities. Often recognized because of their relative size, undisturbed character, or proximity to areas of known significance, these sites may be targeted with future surveys.

6.5 Mapping and Conservation Planning for Sensitive Species

As some data that PNHP collects is considered sensitive, due to threats to the focal species from human collection or other harm, the program has adopted the following general guidelines regarding the release of natural heritage information:

- The discretionary release of PNHP information should help conserve the species, habitat, or site in question.
- Non-sensitive information will be made broadly available, while the distribution of sensitive information will be restricted.

- Sensitive information is defined as location information for species identified by the appropriate jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation. Sensitive species present in Indiana County are identified in Table 2, but these species are not mentioned by name in NHA descriptions.
- The release of sensitive information as defined above (1) will be considered on a case-by-case basis, (2) will be limited to those with a demonstrated need to know, and (3) will require a signed information sharing agreement.
- The decision to release sensitive information will be made by the agency having jurisdiction over the species in question. Valid reasons for releasing sensitive information could include, but are not be limited to, environmental review, research, and conservation planning. The information sharing agreement will define restrictions on how the information can be used and limit further distribution or sharing.

Information that is not considered sensitive will be made available as supporting habitat conservation-planning polygons and will include the name of the species or community present. Requests for more detailed information will be considered on a need-to-know basis and will require an information sharing agreement. Spatial representation for these sensitive species will be consistent with PNHP data sharing guidelines outlined above. These are presented as large, statewide level sites which will contain a single polygon feature for a given area that matches merged overlapping CPP Supporting Landscapes for the sensitive species. In some cases this will equate to a range map for the species, and in others, it may be a series of adjacent large forest patches. The scale of these matches the scale at which jurisdictional agencies are comfortable allowing species information to be released. These will sufficiently obscure the precise locations of sensitive species occurrences. Conservation planning information will follow a similar format as all other NHA Site Accounts and will include a description of the species present, habitat needs, general threats and stresses,and conservation recommendations. This information will not be specific to a particular occurrence, but rather it will provide guidance for users of the data to have a general awareness of the taxa and to be able to use the information in project planning and broad-scale conservation efforts.

7 RESULTS

To update this County Natural Heritage Inventory, the botanists, ecologists, and zoologists of the Pennsylvania Natural Heritage Program, and partner organizations, have explored the natural resources of Indiana County. This work represents an organized effort to inventory the biodiversity present throughout the county. Some of the earliest formal natural history study in this area was completed in the early part of the 19th century. These early explorers provided records that, whenever possible, have been updated in this report. In the surveys conducted for this inventory, researchers have not only identified rare, threatened, and endangered plants and animals, but also many common species, for which no formal records previously existed in museum and agency records.

7.1 Indiana CNHI Update Changes

The Indiana CNHI 2021 Update report is meant to replace the original Indiana County Natural Areas Inventory that was completed in 2011. The original 2011 report was based on two years of field work supplemented by existing data to inform the report. The 2021 Update followed the basic model of the original 2011 project with two years of field work and existing data in the PNHP database used to inform the 2021 Update report.

7.1.1 Natural Heritage Area (NHA) Name Changes

Sites in the previous report were referred to Biological Diversity Areas (BDAs), Landscape Conservation Areas (LCAs), Dedicated Areas (DAs), and Other Heritage Areas (OHAs). All of these sites of ecological significance are now referred to as Natural Heritage Areas (NHAs).

7.1.2 Changes in number of significant ecological features and shape of NHA mapping

The natural resources of the region are continually changing. As habitats and land use patterns change, so do the species that occupy them. Periodic updates to the Indiana County Natural Heritage Inventory will be necessary to reflect these changes. The Natural Heritage Areas depicted in this report in many cases differ significantly from the previous report. There are several reasons why this has occurred:

- The primary cause for changes in shapes of Natural Heritage Areas is the use of a different protocol for mapping the species of concern. The sites developed in past reports were drawn by different biologists at different times for many different species using best professional judgment. This often resulted in vast discrepancies between sites drawn for the same species by different biologists. In order to achieve a more standardized approach to NHA depiction, the PNHP has developed a more formulaic method for identifying areas of concern around each species present at any one location.
- Some species documented in the previous report, through additional fieldwork across the state, have been found to be more common than previously thought and have been delisted, and are no longer considered to be species of concern for which special mapping and management is required. If an area documented in the previous report only contained a species of concern that has since been delisted, it will no longer be represented in this report, which focuses on those species considered to be currently at risk of global extinction or local extirpation.
- Several areas that were in close proximity to each other have been combined into one NHA.
- Some large sites have been split into smaller, more discrete NHAs, especially when each new, smaller NHA constitutes a separate habitat type or faces unique management challenges. Some areas were enlarged if additional fieldwork expanded the known extent of a population of species of concern at a location.
- Some areas were eliminated if the habitat at the location was considered no longer able to support the species formerly documented at the location. This may have resulted from significant changes to, or destruction of, the suitable habitat.
- Former "Significant Geologic Features" were not considered for this report as they are not living resources.
- Many new NHAs have been added for several reasons:
  - New field work resulted in the documentation of new locations for species of concern.
  - Species previously not tracked have been added to the species of concern list due to declines in known populations (e.g. wood turtle).
  - Use of a longer time frame from which to draw data. The past cutoff date beyond which records were not considered for these reports was 1980. Now employed is a "rolling window" of 40 years for plants and 30 years for animals, to more closely reflect what is considered in the environmental review process, while providing only information about habitats which PNHP believes are likely to support extant populations of species of concern.
  - Some entire groups of organisms were not previously considered for reports and now are (e.g.,dragonflies). The PNHP previously lacked sufficient taxonomic expertise, or comprehensive species distribution data, to consider groups of organisms which are now included in the report.

7.1.3 Document layout

The 2011 Indiana NHI was organized by USGS quadrangle. The 2021 Update is organized alphabetically by NHA name, with only one site depicted on each map. The scale of each map is based on the relative scale of the NHA.

7.2 Species and Communities of Concern in Indiana County

Fifty-four species and natural communities of concern were documented in Indiana County for this report (Table 6). Many of these have multiple occurrences across several Natural Heritage Areas across the county. Factsheets describing habitats, threats,and conservation recommendations for many of these species may be found on the PNHP website at http://www.naturalheritage.state. under Species Lists. Species names followed by an asterisk are sensitive species, which are not identified at the site level.

Table 6: *Species and Natural Communities of Concern in Indiana County.*

Species Common Name (Scientific Name)	Global Rank	State Rank	PA Legal Status	PABS Status
Mammals				
Silver-haired Bat (*Lasionycteris noctivagans*)	G3G4	S1	–	CR
Eastern Small-footed Bat (*Myotis leibii*) *	G4	S2	PT	PT
Little Brown Bat (*Myotis lucifugus*) *	G3	S1	PE	–
Northern Long-eared Bat (*Myotis septentrionalis*) *	G1G2	S1	PE	CR
Allegheny Woodrat (*Neotoma magister*)	G3G4	S2	PT	PT
Birds				
Great Blue Heron (*Ardea herodias*)	G5	S5B,S4N,S4M	–	–
Long-eared Owl (*Asio otus*) *	G5	S1B,S3N,S3M	PT	PT
Bald Eagle (*Haliaeetus leucocephalus*)	G5	S4B,S5N,S4M	DL	PT
Osprey (*Pandion haliaetus*)	G5	S3B,S3M	–	PT
Sora (*Porzana carolina*)	G5	S3B,S3M	–	CR
Amphibians				
Eastern Hellbender (*Cryptobranchus alleganiensis alleganiensis*) *	G3T2	S2S3	–	–
Mudpuppy (*Necturus maculosus*) *	G5	S3	–	–
Common Mudpuppy (*Necturus maculosus maculosus*) *	G5	S3	–	–
Reptiles				
Wood Turtle (*Glyptemys insculpta*) *	G3	S3S4	–	–
Queen Snake (*Regina septemvittata*) *	G5	S3S4	–	–
Woodland Box Turtle (*Terrapene carolina carolina*) *	G5T5	S3S4	–	–
Fish				
Least Brook Lamprey (*Lampetra aepyptera*)	G5	S4	PC	CR
Freshwater Mussels				
Elktoe (*Alasmidonta marginata*)	G4	S3S4	–	N
Snuffbox (*Epioblasma triquetra*) *	G3	S2	PE	PE
Wabash Pigtoe (*Fusconaia flava*)	G5	S2S3	–	PE
Wavy-rayed Lampmussel (*Lampsilis fasciola*)	G5	S3S4	–	N
Round Pigtoe (*Pleurobema sintoxia*)	G4G5	S3S4	–	PE
Rayed Bean Mussel (*Villosa fabalis*) *	G2	S1S2	PE	PE
Rainbow Mussel (*Villosa iris*)	G5	S3	–	PE
Plants				
Mountain Bugbane (*Actaea podocarpa*)	G4	S3	PT	PR

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Species Common Name (Scientific Name)	Global Rank	State Rank	PA Legal Status	PABS Status
Bushy Bluestem (*Andropogon glomeratus*)	G5	S3	TU	PR
Queen-of-the-prairie (*Filipendula rubra*)	G4G5	S1S2	TU	TU
Golden-seal (*Hydrastis canadensis*) *	G3G4	S4	PV	PV
Roundleaf Groundsel (*Packera obovata*)	G5	SNR	–	SP
Wild Ginseng (*Panax quinquefolius*) *	G3G4	S4	PV	PV
Purple-fringeless Orchid (*Platanthera peramoena*) *	G5	S2	PT	PT
Leaf-cup (*Smallanthus uvedalia*)	G4G5	S3	N	PR
Shining Ladies'-tresses (*Spiranthes lucida*)	G4	S3	N	PT
Featherbells (*Stenanthium gramineum*)	G4G5	S4	N	W
Thick-leaved Meadow-rue (*Thalictrum coriaceum*)	G4	S2	PE	PT
Declined Trillium (*Trillium flexipes*) *	G5	S2	TU	PT
Reserved for Trillium erectum x flexipes (*Trillium x 1*) *	GNA	S2	–	PT
Netted Chainfern (*Woodwardia areolata*)	G5	S3	N	PR
Snails and Slugs				
Delicate Vertigo (*Vertigo bollesiana*)	G4G5	S3	–	–
Dragonflies and Damselflies				
Ocellated Darner (*Boyeria grafiana*)	G5	S4	–	–
Tiger Spiketail (*Cordulegaster erronea*)	G4	S3	–	–
Arrowhead Spiketail (*Cordulegaster obliqua*)	G4	S3	–	–
Tule Bluet (*Enallagma carunculatum*)	G5	S1S3	–	–
Spine-crowned Clubtail (*Gomphus abbreviatus*)	G4	S2S3	–	–
Mustached Clubtail (*Gomphus adelphus*)	G5	S3S4	–	–
Rapids Clubtail (*Gomphus quadricolor*)	G3G4	S2S3	–	–
Sable Clubtail (*Gomphus rogersi*)	G4	S3	–	–
Northern Pygmy Clubtail (*Lanthus parvulus*)	G4G5	S4	–	–
Butterflies				
Baltimore Checkerspot (*Euphydryas phaeton*)	G4	S3	–	–
West Virginia White (*Pieris virginiensis*)	G2G3	S2	–	–
Crustaceans				
Franz's Cave Isopod (*Caecidotea franzi*) *	G2G4	S1	–	–
Allegheny Cave Amphipod (*Stygobromus allegheniensis*) *	G5	S2S3	–	–
Communities and Natural Features				
Hemlock Palustrine Forest	GNR	S3	–	–
Sugar Maple - Mixed Hardwood Floodplain Forest	GNR	S4	–	–

All of the above species are mapped within an NHA, except for the following species: *Glyptemys insculpta, Terrapene carolina carolina*. Due to a combination of sensitivity issues, these species have created challenges for being incorporated into meaningful conservation planning products, namely Natural Heritage Areas. Their distribution and conservation threats and recommendations will be detailed in Section 7.4.

7.3 Natural Heritage Areas of Indiana County

This inventory of rare species has resulted in the designation of 44 Natural Heritage Areas in Indiana County (Table 7). Brief site descriptions and their significance ranks are presented in (Table 7). Seven of the sites are ranked as having Global Significance, 8 have Regional Significance, 29 have State Significance, and has Local Significance. Criteria for these significance ranks are discussed in more detail in the Methods section of this document.

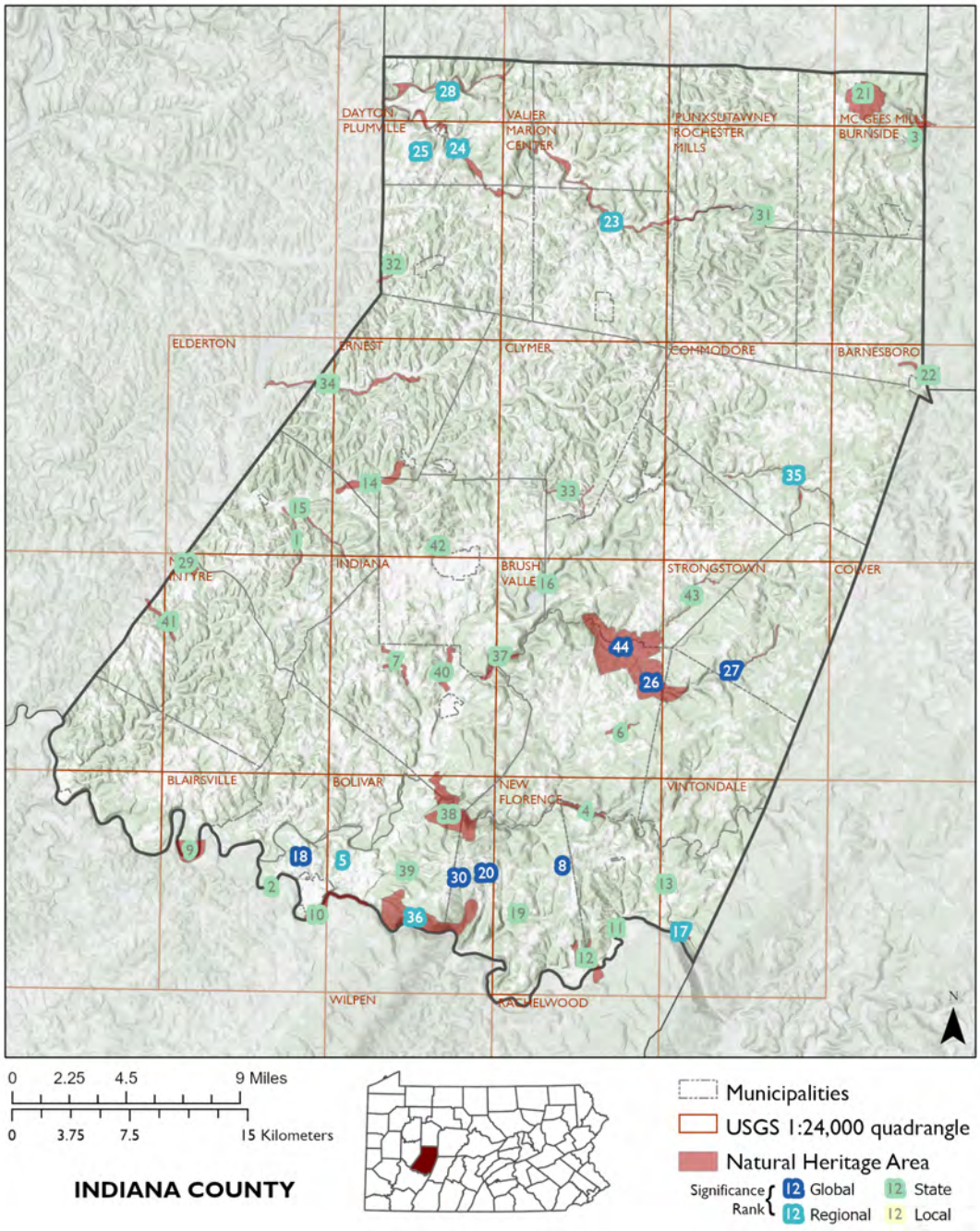

Figure 13: *Natural Heritage Areas of Indiana County.*

The total area of NHA within Indiana County is more than 16,700 acres. Fourteen NHAs have a portion of their area protected; totaling 6,062 acres. Five NHAs have 90% of their area under some form of protection. Please consult an individual NHA for more detailed information about protection status.

Table 7: *Natural Heritage Areas categorized by significance. The results of the Natural Heritage Inventory are summarized in order of their ecological significance based on the number and degree of rarity of species they support. Significance ranks are Global, Regional, State, and Local.*

Map ID	Site Name	Significance Rank	Brief Description
1	Anthony Run NHA	State	Anthony Run hosts an aquatic species of concern.
2	Bairdstown NHA	State	Forest along the Conemaugh River provides nesting habitat for a species of concern.
3	Bear Run at State Game Land 174 NHA	State	A small forested stream supports dragonfly species of concern.
4	Blacklick Creek NHA	State	The steep forested slopes along Blacklick Creek provides habitat for a plant species of concern.
5	Blairsville NHA	Regional	A small patch of forest near Blairsville supports a sensitive species of concern.
6	Brush Creek at Brush Creek Road NHA	State	This section of creek provides habitat for a species of concern.
7	Cherry Run North NHA	State	Cherry Run and the surrounding shrubby vegetation provide habitat for a sensitive species of concern.
8	Clyde NHA	Global	A forest patch along William Penn Highway provides habitat for a sensitive species of concern.
9	Conemaugh Reservoir NHA	State	Two bird species of concern nest along the Conemaugh River.
10	Conemaugh River at Blairsville NHA	State	This section of the Conemaugh River provides habitat for a species of concern.
11	Conemaugh River at Power Plant Rd NHA	State	Hillside above Conemaugh River provides nesting habitat for a species of concern.
12	Conemaugh River at Pumphouse Rd NHA	State	The mostly wet, wooded slopes along the Conemaugh River at this site provide habitat for a variety of species of concern.
13	Cramer Pike NHA	State	Forested areas near a pipeline provide habitat for a species of concern.
14	Crooked Creek at Creekside NHA	State	A community of concern occurs along Crooked Creek.
15	Curry Run NHA	State	Curry Run provides habitat for an aquatic species of concern.
16	East Pike NHA	State	Forest along Two Lick Creek Reservoir provides habitat for a species of concern.
17	Findley Run Slope NHA	Regional	The slopes above Findlay Run provides habitat for a species of concern.
18	High Rise Drive NHA	Global	Forest patch provides habitat for a sensitive species of concern.
19	Jericho Rd NHA	State	Steep wooded slopes provide habitat for a plant species of concern.
20	Jessie Penrose Road NHA	Global	A small patch of woodlands supports a sensitive species of concern.
21	Johnsonburg NHA	State	A woodlot near agricultural fields provides habitat for a species of concern.

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Map ID	Site Name	Significance Rank	Brief Description
22	Kilns Run NHA	State	Stream and associated riparian habitat that supports a species of concern.
23	Little Mahoning Creek NHA	Regional	Upper Little Mahoning Creek provides habitat for several aquatic species of concern.
24	Little Mahoning Creek - Lower NHA	Regional	Little Mahoning Creek hosts many species of concern.
25	Little Mahoning Creek Tributary NHA	Regional	This section of the Little Mahoning Creek watershed hosts a sensitive aquatic species of concern.
26	Little Yellow Creek NHA	Global	Little Yellow Creek and the surrounding forested slopes provide habitat for several species of concern.
27	Little Yellow Creek at Strongstown NHA	Global	This section of Little Yellow Creek, and the surrounding forested valley support several species of concern.
28	Mahoning Creek - Indiana County NHA	Regional	Mahoning Creek and the surrounding forest support many species of concern.
29	Montgomery Road NHA	State	Sloping wetland around a gas well provides habitat for a plant species of concern.
30	Mountain View Road NHA	Global	A small patch of woodlands supports a sensitive species of concern.
31	Nashville Swamp NHA	State	Forested swamp that supports a rare plant community and a species of concern.
32	North Branch Plum Creek NHA	State	Plum Creek provides habitat for an aquatic species of concern.
33	Onberg NHA	State	Crooked Creek provides habitat for an aquatic species of concern.
34	South Branch Plum Creek NHA	State	Aquatic and riparian habitat along Plum Creek provide habitat for a number of species of concern.
35	South Branch Two Lick Creek NHA	Regional	The creek and its forested slopes provide habitat for a variety of aquatic and terrestrial species of concern.
36	State Game Land 153 NHA	Regional	The forested and rocky slopes, abandoned quarries, and caves in and around State Game Land 153 provide habitat for many species of concern.
37	State Game Land 273 NHA	State	Ferrier Run, along SGL 273, provides habitat for a sensitive species of concern.
38	State Game Land 276 NHA	State	Forests around and within State Game Lands 276 support several species of concern.
39	Toms Run at Pine Ridge Park NHA	State	Mesic slopes support a population of a sensitive species of concern.
40	Two Lick Creek NHA	State	The creek and shrubby surrounding vegetation provide habitat for a sensitive species of concern.
41	Whiskey Run NHA	State	Stream provides habitat for a sensitive species of concern.
42	White's Woods NHA	State	Mature forested slopes provide habitat for a plant species of concern.
43	Yellow Creek NHA	State	Yellow Creek provides habitat for an aquatic species of concern.

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Map ID	Site Name	Significance Rank	Brief Description
44	Yellow Creek State Park NHA	Global	The lake and surrounding forest and wetlands in Yellow Creek State Park provides habitat for several species of concern.

7.4 Planning for Sensitive Species

Due to a combination of sensitivity issues, some species have created challenges for being incorporated into meaningful conservation planning products, namely Natural Heritage Areas. These issues are primarily a combination of:

- The species being too sensitive for its location to be pinpointed to an area of core habitat that it makes use of, even if its name is obscured in NHA site accounts and it is listed as sensitive. These are often species which are poached or collected, or species which are extremely sensitive to disturbances.
- The species is wide-ranging and too mobile on the landscape for a core habitat patch to meaningfully define the area of habitat that it relies on.

Rather than create NHA core habitats which are too large to meaningfully allow concrete conservation actions to be planned, PNHP has elected to share range maps of the species which fall into the above categories and are present in Indiana County, and describe their general conservation needs below.

7.4.1 Wood Turtle (*Glyptemys insculpta*)

The wood turtle (Glyptemus insculpta) is primarily a terrestrial turtle, found most often near cool streams in hardwood forests, marshy meadows, farmland, and red maple swamps. Its name, "insculpta" refers to the sculptured look of its dark brown, ornate shell. While this turtle can move quite long distances for a turtle, it is faithful to its home, returning to nesting and overwintering sites every year. This species is also long-lived, known to survive up to 40 years in the wild. It is omnivorous, eating primarily wild fruits, tender green leaves, insects, tadpoles, and worms. Wood turtles occur from Virginia north to Quebec, although they are apparently declining throughout the range.

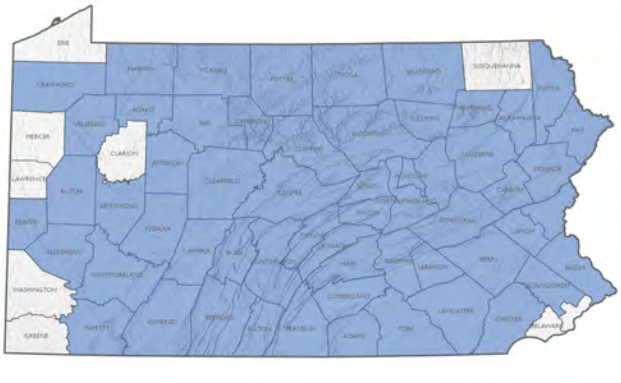

Figure 14: *Range map for Wood Turtle (Glyptemys insculpta) indicating where environmental review conflicts may be encountered.*

The primary reasons for this turtle's decline are from road kill, loss of habitat, and collection for the pet trade. Collection has eliminated entire populations in some areas. While it is illegal to collect this turtle, its sale is still allowed, spurring continued poaching of the species. This is particularly problematic, as wood turtles are long-lived and slow to reproduce; they do not mature sexually until they reach 14-18 years old. Because this turtle is primarily terrestrial and highly mobile within its range, habitat fragmentation and roads are a serious danger as well.

- Habitat fragmentation is a threat to wood turtles. Roads, railroads, development, and energy infrastructure disrupt movement corridors and make it more likely that turtles will be killed by vehicles while crossing roads. These turtles are, however, somewhat tolerant of low-impact human land uses (e.g. pastures and timbering).
- Collection of wood turtles is prohibited. Law enforcement should be made aware of these rules, and enforce these protections as necessary.
- Predation is an increasing threat to this species. Human habitat disturbance facilitates species such as raccoons and skunks, which frequently eat the eggs of this species. Raccoons have also been known to prey on adult wood turtles.

7.4.2 Woodland Box Turtle (*Terrapene carolina carolina*)

The eastern box turtle is one of the most commonly observed species of native turtles, as it is our most terrestrial native turtle species. It is primarily found in moist forests, floodplains, and wet meadows, but also is often seen in urban and suburban areas. Box turtles require a nearby water source (pond, stream, or other shallow wetland), sunny, open habitat for nesting, and thickets, woody debris, or thick leaf litter for shelter. The shell of this species is high-domed, with yellow, olive, or orange markings. The eastern box turtle has a wide range, stretching from Texas to Maine, but appears to be declining in many parts of its range, including Pennsylvania.

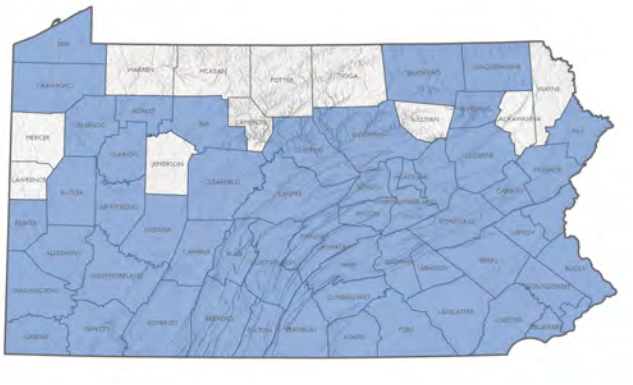

Figure 15: *Range map for Woodland Box Turtle (Terrapene carolina carolina) indicating where environmental review conflicts may be encountered.*

Major threats to the eastern box turtle include habitat destruction, road mortality, and collection for the pet trade.

- Habitat fragmentation is a threat to eastern box turtles. Roads, railroads, development, and energy infrastructure disrupt movement corridors and make it more likely that turtles will be killed by vehicles while crossing roads. These turtles are, however, somewhat tolerant of low-impact human land uses and are frequently seen in urban and suburban areas.
- Collection of eastern box turtles is prohibited throughout the vast majority of its range. Law enforcement should be made aware of these rules, and enforce these protections as necessary.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Future Natural Resource Research in the Region

This Natural Heritage Inventory was developed using the most currently available data from the PNHP databases. The data in this report represents a snapshot of the region's natural resources at the time the report was written. Many potential high quality natural habitats in the region have never been surveyed for species of concern, or may have been visited in a season not conducive to the documentation of the species present. Any further work in the area could yield additional records of species of concern while future land use changes may result in the extirpation of species documented in this report. This is partially due to the fact that natural systems are dynamic and constantly changing due to natural and human induced pressures. Additional survey efforts are encouraged for these reasons. The PNHP considers this report a working document that can and should be updated as new information is available.

8.2 A Final Note on Rare, Threatened, and Endangered Species

The rare, threatened, and endangered species highlighted in this report are some of the several hundred species in Pennsylvania that are threatened with extirpation or extinction. If a species becomes extinct or is lost from a portion of its native range, the ecosystem in which it lived will lose an important element. Often the repercussions of extinctions are not known until the species is gone, and the species is generally irreplaceable in the system. This may be because the habitat has been altered to the point that the biological system no longer functions properly. Species of concern are often indicative of fragile ecosystems that easily degrade; their protection may help monitor the overall quality of the region's ecosystems. A great example of a species of concern acting as an indicator of environmental quality is the bald eagle -a species which indicated the deleterious effects of the pesticide DDT in our environment. Banning DDT led to the eventual recovery of the species, as well as many other species which were similarly impacted. Another reason for protecting species of concern is for their value as unique genetic resources. Every species may provide significant information for future use in genetic research and medical practices. Beyond these practical considerations, perhaps the most compelling reasons for stewardship are the aesthetic and ethical considerations; there is beauty and recreational value inherent in healthy,species-rich ecosystems. The protection of rare, threatened, and endangered species depends on several factors, including increasing scientific knowledge and concerted efforts from government agencies, conservation organizations, educational institutions, private organizations, and individuals The following section outlines general recommendations to begin to protect the species outlined in this report.

8.3 Using the Natural Heritage Inventory in the Planning Process

One of the main roles of this document is to integrate ecological and conservation information into the planning process. Considering this information early in the planning process reduces the likelihood of costly conflicts with rare, threatened and endangered species, and protects these resources for future generations. Comprehensive land use planning and its related ordinances can be effective tools for the conservation of the region's biological diversity. Land use planning establishes guidelines for the kinds of land uses that are suitable in an area and provides a basis for guiding public and private development to benefit communities, the local economy,and the environment. Zoning and subdivision ordinances then set out rules that implement the land use plan. Planning, zoning, and subdivision ordinances are not only valuable tools for urban and suburban areas where development pressures have already affected the use of open space and the integrity of the natural environment, but are also valuablefor rural areas where current losses are less pronounced. These areas can apply planning to avoid the haphazard losses of valuable regional resources, while still achieving desirable levels of development.

Planning for the land use decisions of today and those of the future is an important task and this Natural Heritage Inventory can serve as a useful tool. Pennsylvania Natural Heritage Program staff and expertise are available for additional technical assistance and planning for the conservation of these sites.

8.4 General Recommendations

The following are general recommendations for the protection of the Natural Heritage Areas within the region. Approaches to protecting a Natural Heritage Area are wide ranging, and factors such as land ownership, time constraints, and tools and resource availability should be considered when prioritizing protection of these sites. Prioritization works best when incorporated into a long-term region-wide plan. Opportunities may arise that do not conform to a plan, and the decision on how to manage or protect a natural heritage area may be made on a site by site basis. The following are approaches and recommendations for natural heritage area conservation.

8.4.1 Consider conservation initiatives for natural heritage areas on private land

The following land trusts are active within Indiana County:

- Conemaugh Valley Conservancy
- Evergreen Conservancy
- Western Pennsylvania Conservancy

The above information comes from https://conservationtools.org/cms/group-finder. Please check there for the latest updates as to which land trusts are working in Indiana County.

Conservation easements protect land while leaving it in private ownership. An easement is a legal agreement between a landowner and a conservation or government agency that permanently limits a property's use in order to protect its conservation values. It can be tailored to the needs of both the landowner and the conservation organization, and it will not be extinguished with new ownership. Tax incentives may apply to conservation easements donated for conservation purposes.Lease and management agreements also allow the landowner to retain ownership and temporarily ensure protection of land. There are no tax incentives for these conservation methods. A lease to a land trust or government agency can protect land temporarily and ensure that its conservation values will be maintained. This can be a first step to help a landowner decide if they want to pursue more permanent protection methods. Management agreements require landowners and land trusts to work together to develop a plan for managing resources (such as plant or animal habitat, watersheds, forested areas, or agricultural lands) with the land trust offering technical expertise. Land acquisition by a conservation organization can be at fair market value or as a bargain sale where a purchase price is set below fair market value with tax benefits that reduce or eliminate the disparity. One strategy is to identify areas that may be excellent locations for new county or township parks. Sites that can serve more than one purpose such as wildlife habitat, flood and sediment control, water supply, recreation, and environmental education are ideal. Private lands adjacent to public lands should be examined for acquisition when a natural heritage area is present on either property, and there is a need of additional land to complete protection of the associated natural features.Unrestricted donations of land are welcomed by land trusts. The donation of land entitles the donor to a charitable deduction for the full market value, and it releases the donor from the responsibility of managing the land. If the land is donated because of its conservation value, the land will be permanently protected. A donation of land that is not of high biological significance may be sold, with or without restrictions, to a conservation buyer, and the funds used to further the land trust's conservation mission.

Local zoning ordinances are one of the best-known regulatory tools available to municipalities. Examples of zoning ordinances a municipality can adopt include: overlay districts where the boundary is tied to a specific resource or interest such as riverfront protection and floodplains, and zoning to protect stream corridors and other drainage areas using buffer zones. Often it is overlooked that zoning can prevent municipal or county-wide development activities which are undesirable to the majority of the residents, and allow for planning that can meet the goals of the county residents.

8.4.2 Prepare management plans that address species of concern and natural communities

Many of the natural heritage areas that are already protected are in need of additional management plans to ensure the continued existence of the associated natural elements. Site-specific recommendations should be added to existing management plans or new plans should be prepared. Recommendations may include: removal of invasive plant species; leaving the area alone to mature and recover from previous disturbance; creating natural areas within existing parks; limiting land-use practices such as mineral extraction, residential or industrial development, and agriculture; or implementing sustainable forestry practices. For example, some species simply require continued availability of a natural community while others may need specific management practices such as canopy thinning, mowing,or burning to maintain their habitat requirements. Existing parks and conservation lands provide important habitat for plants and animals at both the county

Figure 16: *Conversation and community engagement are important conservation tools. Photographer: Christopher Tracey, PNHP*

level and on a regional scale. For example, these lands may
serve as nesting or wintering areas for birds,or as stopover areas during migration. Management plans for these areas should emphasize a reduction in activities that fragment habitat. Adjoining landowners should be educated about the importance of their land as it relates to habitat value, especially for species of concern, and agreements should be worked out to minimize activities that may threaten native flora and fauna.

8.4.3 Protect bodies of water

Protection of reservoirs, wetlands, rivers, and creeks is vital for ensuring the health of human communities and natural ecosystems. Waterways that include natural heritage areas, identified in the Results section of this report, are important, sensitive areas that should be protected. Multiple qualities can be preserved by protecting aquatic habitats. For example, conserving natural areas around watersheds that supply municipal water provides an additional protective buffer around the water supply, maintains habitat for wildlife, and may also provide (low impact) recreation opportunities. Many rare species, unique natural communities, and significant habitats occur in wetlands and water bodies, which are directly dependent on natural hydrological patterns and water quality for their continued existence. Ecosystem processes also provide clean water supplies for human communities and do so at significant cost savings in comparison to water treatment facilities. Therefore, protection of high quality watersheds is the primary way to ensure the viability of natural habitats and water quality. Scrutinize development proposals for their impact on entire watersheds, not just the immediate project area. Cooperative efforts in land use planning among municipal, county, state, and federal agencies, developers, and residents can lessen the impact of development on watersheds.

The following watershed associations are active within Indiana County:

- Blacklick Creek Watershed Association
- Connemaugh Valley Conservancy
- Crooked Creek Watershed Association
- Ken Sink Trout Unlimited
- Kiski Watershed Association
- The Stonycreek-Conemaugh River Improvement Project

The above information comes from https://conservationtools.org/cms/group-finder. Please check there for the latest updates as to which watershed associations are working in Indiana County.

8.4.4 Provide for natural buffers in and around natural heritage areas

Development plans should provide for natural buffers between disturbances and critical zones of natural heritage areas. Proposed activities within the Core Habitat of a Natural Heritage Area should be closely scrutinized for potential immediate impacts to the habitat of elements of concern. Proposed activities within the Supporting Landscape of a Natural Heritage Area should be evaluated for potential long-term impacts to habitats of elements of concern, such as water quality, or quantity degradation, or habitat fragmentation. Disturbances may include construction of new roads and utility corridors, non-sustainable timber harvesting, and fragmentation of large pieces of land. Storm runoff from these activities results in the transport of nutrients and sediments into aquatic ecosystems (Trombulak and Frissell, 2000). Vegetated buffers (preferably of Pennsylvania native plant species) help reduce erosion and sedimentation while shading and cooling the water. Preserving water quality in rivers and streams is important to fish as some species, such as brook trout and some darters, are highly sensitive to poor water quality. Sensitive fish are readily lost from streams when water quality starts to decline. Creating or maintaining a vegetated buffer benefits aquatic animal life, provides habitat for other wildlife species, and creates a diversity of habitats along the creek or stream.

8.4.5 Reduce fragmentation of the landscape surrounding natural heritage areas

Encourage development in sites that have already seen past disturbances (especially mined and heavily timbered areas). Care should be taken to ensure that protected natural areas do not become islands surrounded by development. In these situations, the site is effectively isolated, and its value for wildlife is greatly reduced. Careful planning can maintain natural environments along with the plants and animals associated with them. A balance between growth and the conservation of natural and scenic resources can be achieved by guiding development away from the most environmentally sensitive areas. The reclamation of previously disturbed areas for commercial and industrial projects, also known as brownfield development, presents one way to encourage economic growth while allowing ecologically sensitive areas to remain undisturbed. For example, reclaimed surface mines can be used for development (potentially even wind development)when feasible. Cluster development can be used to allow the same amount of development on much less land, and leave the remaining land intact for wildlife and native plants. By compressing development into already disturbed areas with existing infrastructure (villages, roads, existing rights-of-way), large pieces of the landscape can be maintained intact. If possible, networks or corridors of woodlands or greenspace should be preserved linking natural areas to each other. Preserving greenspace around development can provide ample recreation opportunities and potentially increase nearby property value.

8.4.6 Manage for invasive species

Invasive species threaten native diversity by dominating habitat used by native species and by disrupting the integrity of the ecosystems they occupy. Management for invasive species depends upon the extent of their establishment. Small infestations may be easily controlled or eliminated,but larger, well established populations typically present difficult management challenges. The earlier exotic invasive species are identified and controlled, the greater the likelihood of eradication with the smallest expenditure of resources.

8.4.7 Encourage conservation work by grassroots organizations

County and municipal governments can do much of the work necessary to plan for the protection and management of natural areas identified in this report; however, grassroots organizations are needed to assist with obtaining funding, identifying landowners who wish to protect their land, and providing information about easements, land acquisition, management, and stewardship of protected sites. Increasingly, local watershed organizations and land trusts are taking proactive steps to accomplish conservation at the local level. When activities threaten to impact ecological features, the responsible agency should be contacted. If no agency exists, private groups such as conservancies, land trusts, and watershed associations should be sought for ecological consultation and specific protection recommendations.

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10 NATURAL HERITAGE AREA SITE ACCOUNTS

The following section presents the 44 Natural Heritage Areas (NHAs) in Indiana County included in this report. Updated NHA site accounts may be available, please contact PNHP for more details.

1. Anthony Run
2. Bairdstown
3. Bear Run at State Game Land 174
4. Blacklick Creek
5. Blairsville
6. Brush Creek at Brush Creek Road
7. Cherry Run North
8. Clyde
9. Conemaugh Reservoir
10. Conemaugh River at Blairsville
11. Conemaugh River at Power Plant Rd
12. Conemaugh River at Pumphouse Rd
13. Cramer Pike
14. Crooked Creek at Creekside
15. Curry Run
16. East Pike
17. Findley Run Slope
18. High Rise Drive
19. Jericho Rd
20. Jessie Penrose Road
21. Johnsonburg
22. Kilns Run
23. Little Mahoning Creek
24. Little Mahoning Creek - Lower
25. Little Mahoning Creek Tributary
26. Little Yellow Creek
27. Little Yellow Creek at Strongstown
28. Mahoning Creek - Indiana County
29. Montgomery Road
30. Mountain View Road
31. Nashville Swamp
32. North Branch Plum Creek
33. Onberg
34. South Branch Plum Creek
35. South Branch Two Lick Creek
36. State Game Land 153
37. State Game Land 273
38. State Game Land 276
39. Toms Run at Pine Ridge Park
40. Two Lick Creek
41. Whiskey Run
42. White's Woods
43. Yellow Creek
44. Yellow Creek State Park

Anthony Run NHA

A site of State Significance

A small warm water stream, containing a multitude of pools, riffles, and runs, supports a fish species of concern, the **least brook lamprey** (*Lampetra aepyptera*). A variety of other fish are also found in this stream, including minnows, darters, bluegills, and sculpin.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

The least brook lamprey is not parasitic, unlike other more well-known lamprey species. Photo: Fredlyfish4 (https://commons.wikimedia.org/wiki/File:Lampetra_aepyptera_UMFS_1.JPG)

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Least Brook Lamprey (*Lampetra aepyptera*)	G5	S4	PC	CR	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.
[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

Protect water quality in this small stream to protect the fish species of concern which is found here. Sedimentation as a result of erosion and climate change-driven shifts in water levels pose the greatest threats. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads, reducing habitat quality for this fish species. Conserve and expand the forested riparian buffers of this waterway. Streams through forested areas should be considered high priority for conservation. The forested riparian corridor helps to regulate the temperature of the stream and creates streamside conditions that contribute to improved water quality and aquatic habitat. Streams through non-forested areas should be restored with native trees and shrubs appropriate to the habitat. Establish at least a 100 foot buffer of woody vegetation along the creek and its tributaries to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.
- Increased drought, as a result of climate change, could lead to decreased water levels and reduce habitat availability for this fish. Minimize other threats to maximize this species' resiliency to climate change. Create a plan for assessing predicted and current climate change impacts to water levels in the aquatic habitats this species relies on in Pennsylvania.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

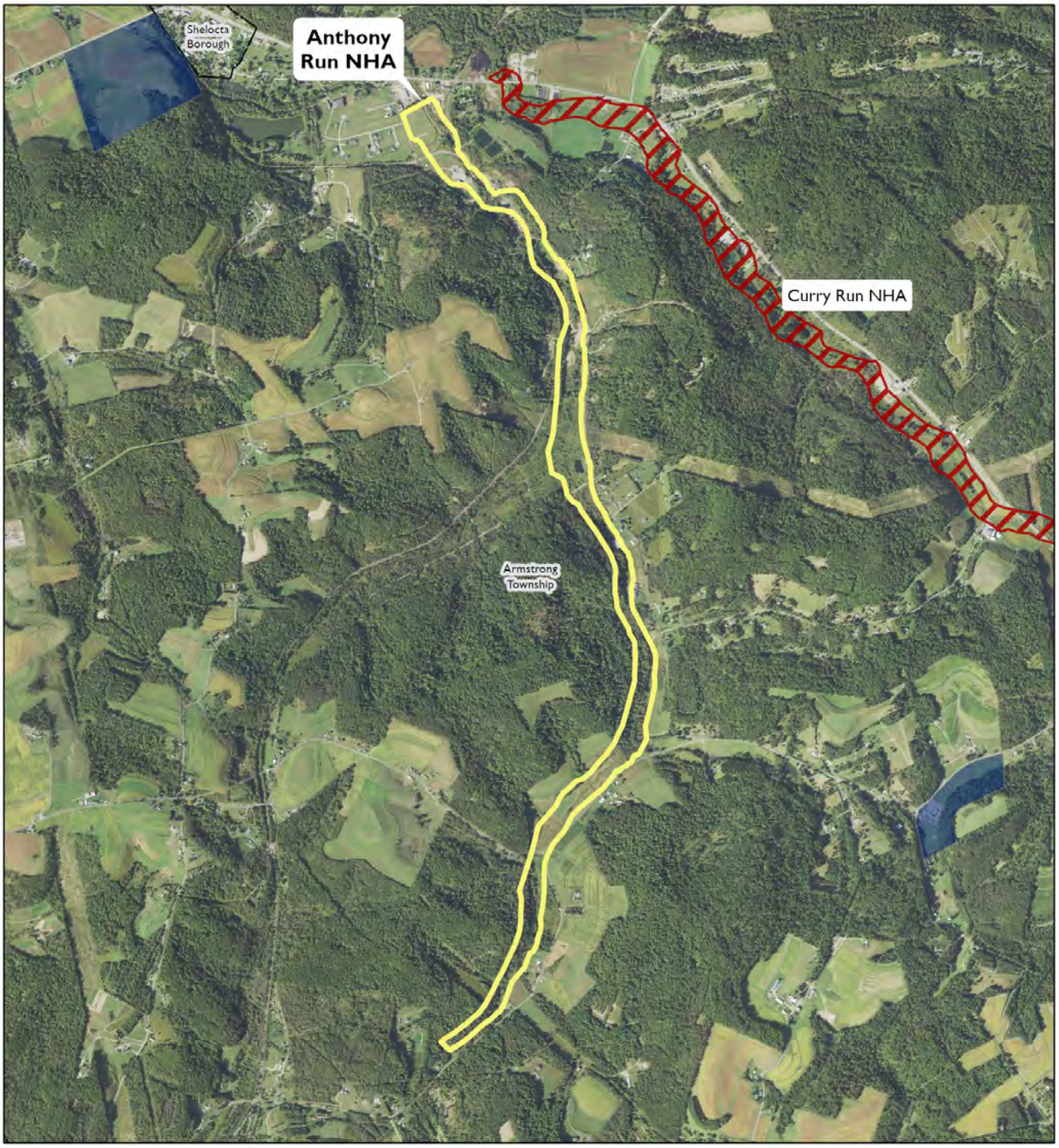
Municipalities: Indiana County: Armstrong Township
USGS quads: Elderton, Mc Intyre
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.

Approximate Acreage: 166 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Anthony Run NHA. Created on 12 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Shelocta Borough
Anthony Run NHA
Curry Run NHA
Armstrong Township
0 0.23 0.45 0.9 Miles
0 0.25 0.5 1 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Bairdstown NHA

A site of State Significance

The forested areas along the Conemaugh River support a nesting colony of **great blue heron** (*Ardea herodias*). **Great blue heron**s are a wetland generalist species and the largest of the American herons. They tend to nest in colonies of anywhere from a few to thousands of pairs. They generally build nests in trees or other vegetation, but this species will also nest on the ground and almost any structure. Nests are well constructed and reused year to year and may reach a great size after several years. Human disturbances, however, can lead to abandonment of nesting sites.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

A great blue heron stands at the edge of the water. Photo: Brad Georgic, WPC

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Great Blue Heron (*Ardea herodias*)	G5	S5B,S4N,S4M	–	–	2015	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

Large nesting colonies tend to splinter up into smaller ones when disturbed regularly by humans. The number of nests has been observed to be positively related to the area of nearby available foraging habitat. Great blue herons also depend on good water quality, as pollution levels impact prey availability and heron health. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- The great blue heron is vulnerable to human disturbance, especially during the breeding season. Landscape disturbances, including road building, timbering, or other developments can cause large nesting colonies to split up into smaller colonies. Significant additional human disturbance within 305 meters (1000 feet) could trigger permanent abandonment of the area, although disturbance within the Core Habitat should not be a problem for this species if it occurs during the non-breeding season (September – February).
- Degradation of water quality can have a negative impact on the habitat supporting the species of concern found at this location. The stormwater runoff from roadways, suburban development, and agriculture should be considered a potential source of significant contamination for the wetland habitat. Runoff from these sources has significantly higher levels of sediment, nutrients, pesticides, herbicides, and other pollutants than runoff filtered through a natural habitat. Maintaining a high quality aquatic habitat is important to the species of concern found at this location. Improve the water quality and maintain the water quantity of the wetland habitat. Protect and enhance existing aquatic habitats by monitoring water quality and enforcing protections. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area, including creating buffers to protect wetlands from upland disturbances.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation

strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

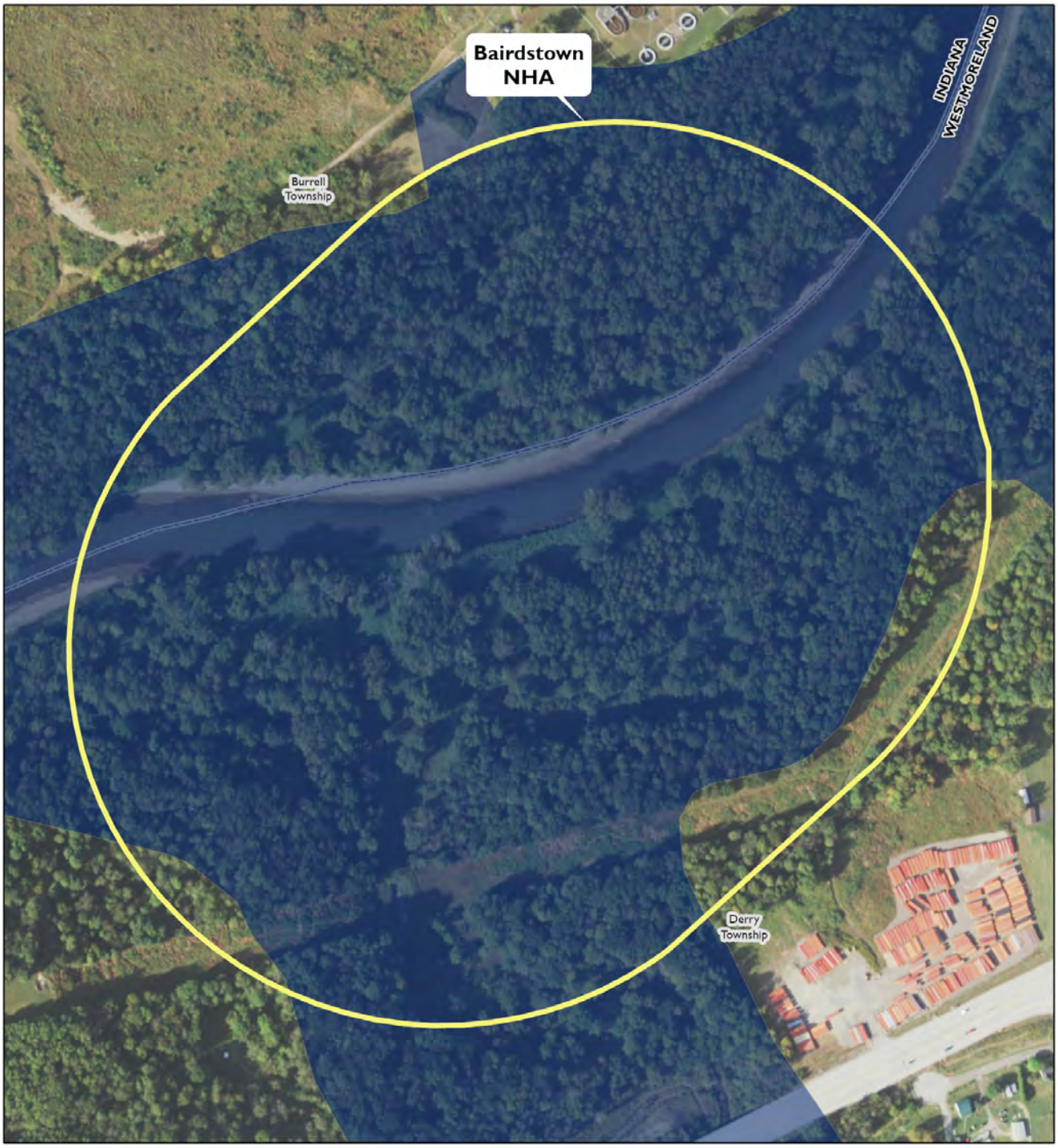
Municipalities: Indiana County: Burrell Township; Westmoreland County: Derry Township

USGS quads: Blairsville
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 98 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Bairdstown NHA. Created on 14 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx



0 0.03 0.07 0.13 Miles

0 0.04 0.07 0.15 Kilometers

N

PNHP

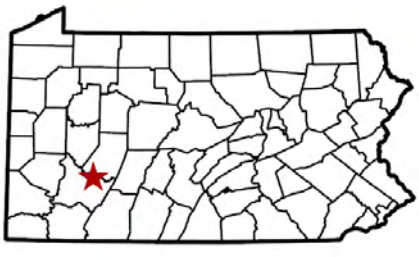
Pennsylvania Natural Heritage Program

NHA Core Habitat

Other NHAs

Protected Land

Conservation Easement



Bear Run at State Game Land #174 NHA

A site of State Significance

The headwaters of Bear Run originate in the southeastern corner of Jefferson County, flowing southward into Indiana County before joining with the West Branch of the *Sus*quehanna River in Clearfield County. This NHA encompasses approximately three miles along Bear Run and South Branch Bear Run, mostly occurring within State Game Land 174. A dragonfly species, **Arrowhead Spiketail** (*Cordulegaster obliqua*), use the northern section of Bear Run as breeding habitat.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

Arrowhead Spiketail (*Cordulegaster obliqua*). Photo: Judy Gallagher, Creative Commons

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Ocellated Darner (*Boyeria grafiana*)		G5	S4	–	–	2007	E
Arrowhead Spiketail (*Cordulegaster obliqua*)		G4	S3	–	–	2007	AC
Northern Pygmy Clubtail (*Lanthus parvulus*)		G4G5	S4	–	–	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

This dragonfly species depends upon high quality water, the regulation of water temperature levels provided by forest cover, and the seasonal input of detritus and other organic material supplied from the forest. Excess input of nutrients from human activities in the watershed causes bacterial growth that reduces the oxygen content of the water. The South Branch of Bear Run is heavily influenced by abandoned mine drainage (AMD) and the water quality of the stream highly degrades where the north branch joins with this section. Additionally, many gas wells exist within this watershed which may cause impacts from sedimentation and pollution. Remediation of the AMD influenced streams downstream of this site and subsequent improvement of the water quality could expand habitat for the species of concern and other aquatic species including fish. Best management practices should be used to prevent negative impacts of sedimentation and other effects of roads and gas well development. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Damselflies and dragonflies rely on good water quality, although the tolerances of individual species to different types of pollution are not well-understood. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants such as heavy metals, pesticides, and abandoned mine drainage are potential threats to these species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 feet) buffer of native woody vegetation where it exists along the waterways and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.
- Fragmentation of existing habitat poses a threat to species of concern. Avoid fragmenting the existing forested areas with additional buildings or infrastructure. Avoid logging in this area except as it relates to invasive species removal. The forest cover should be allowed to achieve and maintain old-growth characteristics.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

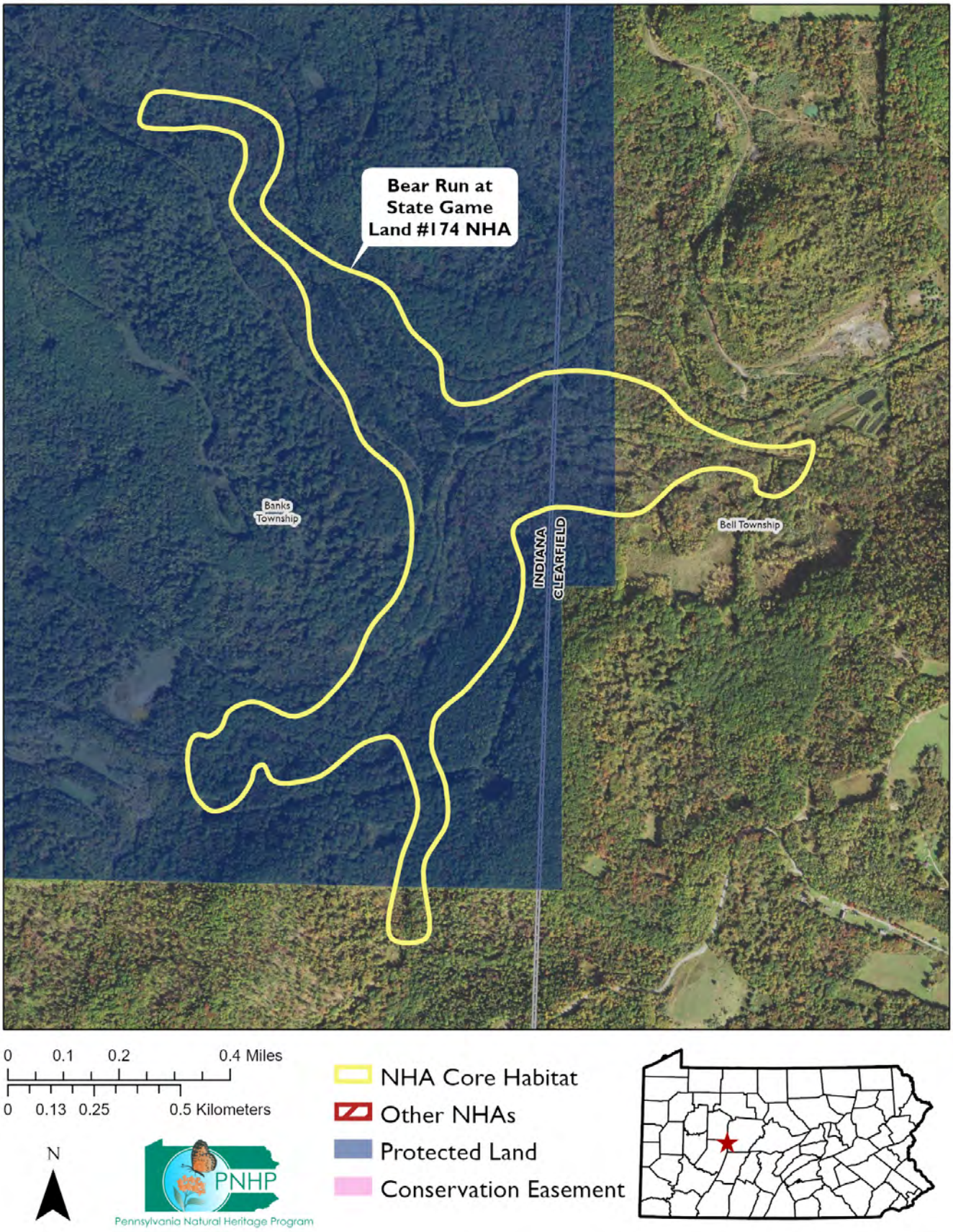
Location

Municipalities: Clearfield County: Bell Township; Indiana County: Banks Township
USGS quads: Burnside, Mc Gees Mills
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: State Game Land 174
Approximate Acreage: 226 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Bear Run at State Game Land #174 NHA. Created on 12 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Bear Run at State Game Land #174 NHA
Banks Township
Bell Township
INDIANA
CLEARFIELD
0 0.1 0.2 0.4 Miles
0 0.13 0.25 0.5 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Blacklick Creek NHA

A site of State Significance

This steep, north facing hillside above Blacklick Creek is a rocky hardwood forest dominated by sugar maple (*Acer saccharum*), red oak (*Quercus rubra*), birch (*Betula* spp.), and tuliptree (*Liriodendron tulipifera*). The forested habitat supports a population of **mountain bugbane** (*Actaea podocarpa*), a Pennsylvania rare plant species. A small population of golden club (*Orontium aquaticum*) can be found in the flat open bottom slope of a drainage that enters Blacklick Creek. While this species used to be tracked, it is now considered common enough to be a "watchlist" species. Associated plants found here include rosebay (*Rhododendron maximum*), rushes (*Juncus* spp.), and *Ludwigia* spp.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

Mountain bugbane (*Actaea podocarpa*) in flower Photo: Pete Woods, PNHP

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Mountain Bugbane (*Actaea podocarpa*)	G4	S3	PT	PR	2007	BC

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

The forested habitat has been fragmented by agricultural fields, and Route 56 crosses Blacklick Creek at the eastern end of this NHA. Protect the remaining forested habitat and maintain a forested buffer along roadways. Japanese knotweed (*Fallopia japonica*) is present in portions of the site and if left uncontrolled it may become the dominant plant along the waterway to the exclusion of all other species. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Mountain bugbane depends on relatively undisturbed, rich hardwood forests. Development and logging activities are the primary threats to this species. Protect remaining habitat from fragmentation and conversion to housing, pipelines, and other land uses. For more information about the status of forested land in Pennsylvania, see Albright et al. (2017).
- Fragmentation of existing habitat poses a threat to species of concern. Avoid fragmenting the existing forested areas with additional buildings or infrastructure. Avoid logging in this area except as it relates to invasive species removal. The forest cover should be allowed to achieve and maintain old-growth characteristics.
- Aggressive non-native plant species are a potential threat, such as the Japanese knotweed known at this site. Left to spread, these species can crowd out the species of concern, as well as other native plant species. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try to repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. Continual invasive species monitoring and control will likely be necessary.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the

species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: East Wheatfield Township, Brush Valley Township

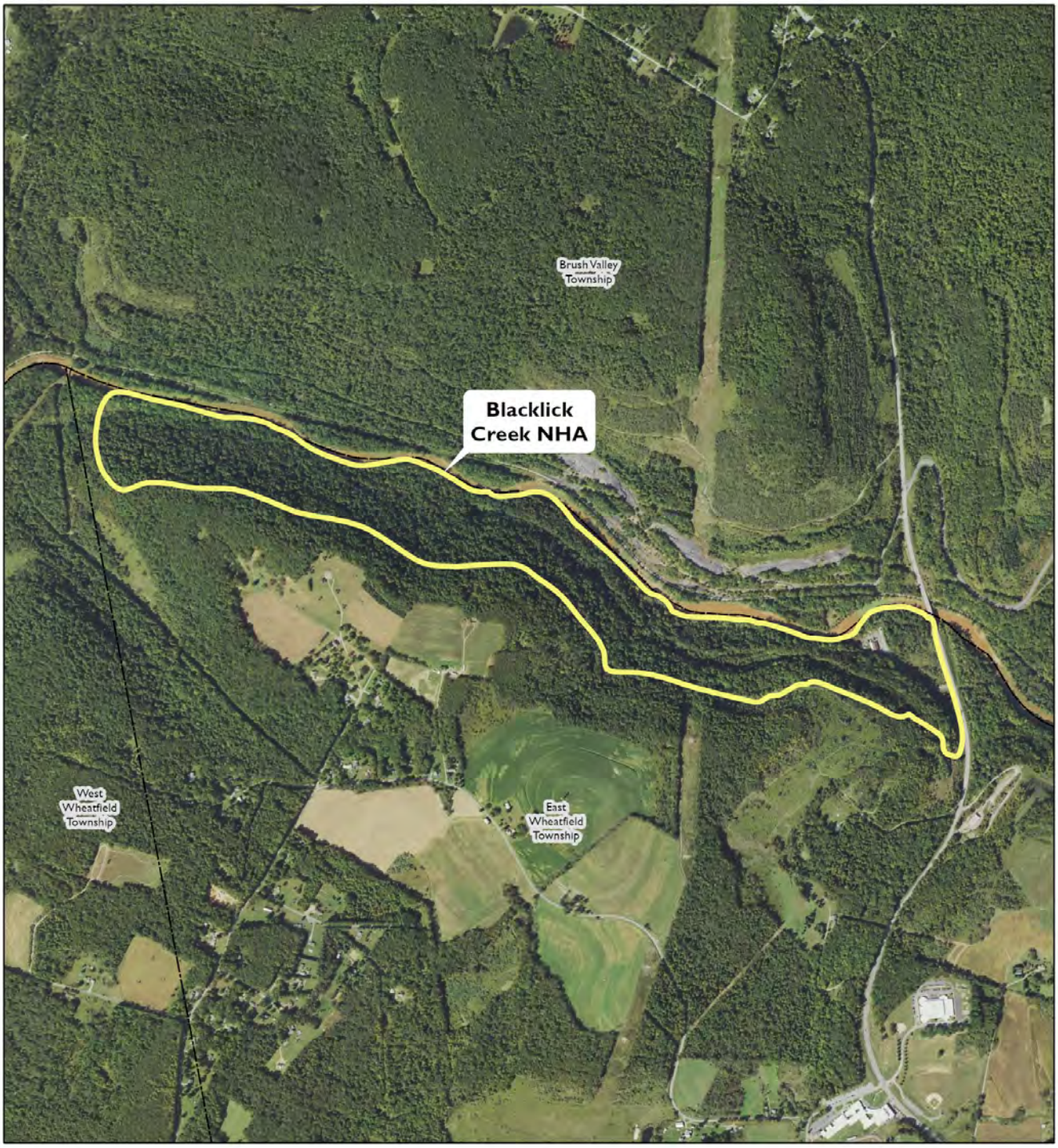
USGS quads: New Florence
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 174 acres

References

Albright, Thomas A. et al. (2017). *Pennsylvania forests 2014*. NRS-RB-111. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. DOI: 10.2737/NRS-RB-111. URL: https://www.nrs.fs.fed.us/pubs/54420 (visited on 01/30/2019).

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Blacklick Creek NHA. Created on 15 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Brush Valley Township
Blacklick Creek NHA
West Wheatfield Township
East Wheatfield Township
0 0.13 0.25 0.5 Miles
0 0.15 0.3 0.6 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Blairsville NHA

A site of Regional Significance

The Blairsville NHA is situated between Route 22 and Blacklick Creek. The delineated area includes small, scattered woodlots, agricultural fields, and residential development. This area provides habitat for a sensitive species of concern.

This site is of Regional significance. It has been assigned this significance level because of the occurrence of a sensitive species of concern that is of G3 rank.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2014	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

This area has been heavily disturbed by agriculture, logging, and development. Railroad tracks run along the southern end of the NHA, and a utility right-of-way cuts through the northern end. Maintain the existing wooded habitats and allow it to regenerate with native vegetation where possible. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- The sensitive species of concern relies on intact, interior forest habitat with many large, old trees and standing snags for foraging and roosting. Fragmentation as a result of human developments, or logging, are threats to this species. Avoid the removal of large native trees and allow snags or dying trees to persist upon the landscape as these provide suitable summer roost areas.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

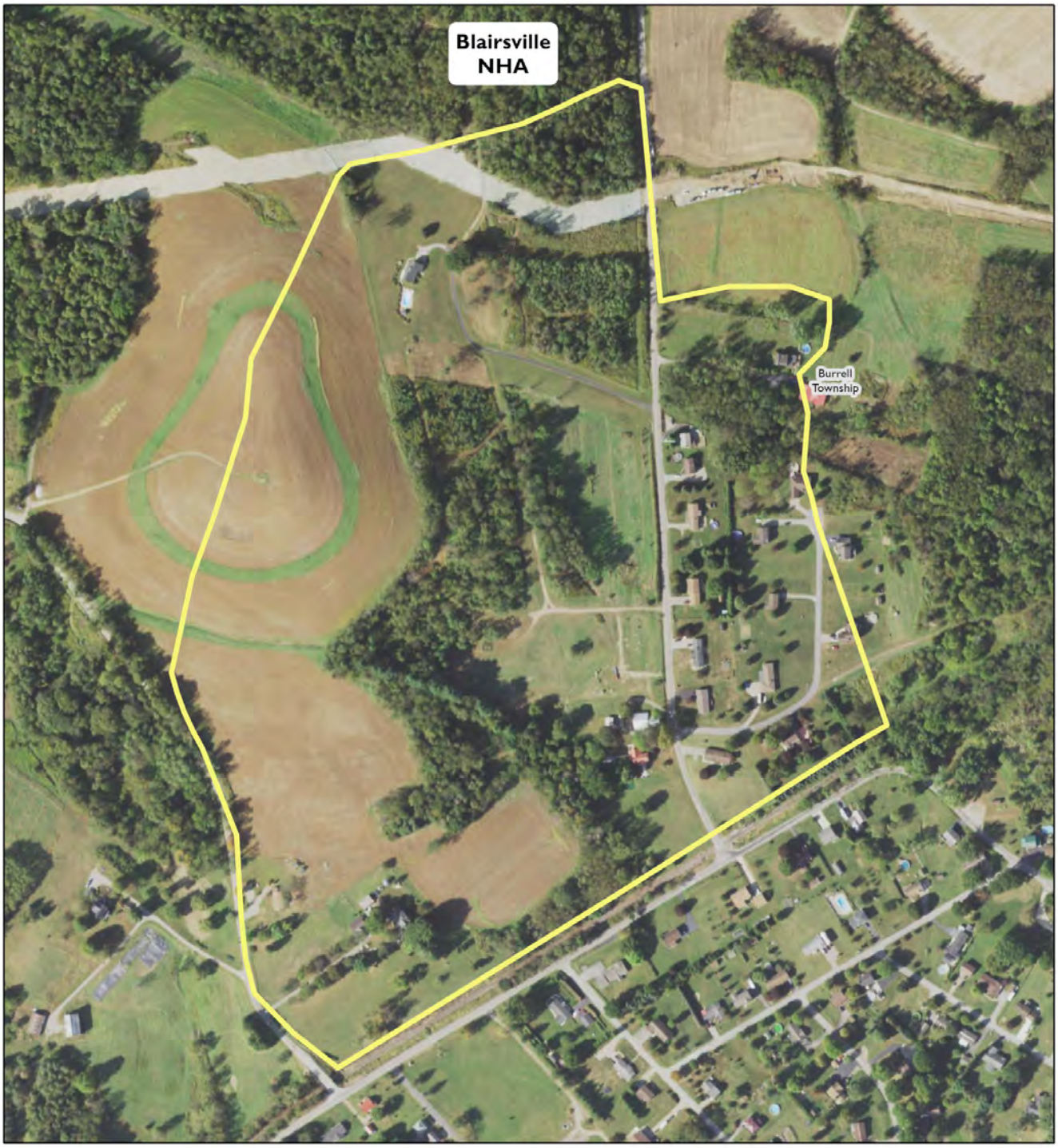
Municipalities: Indiana County: Burrell Township

USGS quads: Bolivar
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 90 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Blairsville NHA. Created on 12 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx



0 0.04 0.07 0.15 Miles

0 0.04 0.09 0.17 Kilometers

N

PNHP

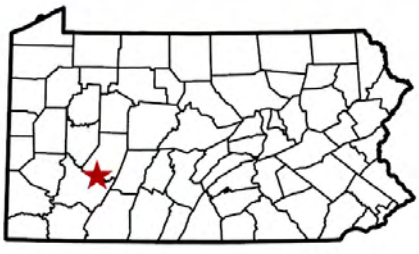
Pennsylvania Natural Heritage Program

NHA Core Habitat

Other NHAs

Protected Land

Conservation Easement



Brush Creek at Brush Creek Road NHA

A site of State Significance

Brush Creek is a small stream in Indiana County, originating in large remnant forest patches east of a primarily agricultural area. The good water quality and shading from the forest creates stream habitat that supports a rare dragonfly species of concern, the **spine-crowned clubtail** (Gomphus abbreviatus). This species ranges throughout the northeastern states, but is relatively uncommon in all of them. It is generally found along medium-sized streams with rocky areas and muddy substrates.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

The spine-crowned clubtail, a rare dragonfly found along Brush Creek. Photo: Judy Gallagher, Creative Commons

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status[1]	PABS Status[1]	Last Observed	Quality[2]
Spine-crowned Clubtail (*Gomphus abbreviatus*)	G4	S2S3	–	–	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

The headwaters of Brush Creek are primarily forested, but downstream from this stretch, the landscape becomes more agricultural and developed. Neighboring watersheds, such as Little Brush Creek, which runs through Brush Valley, are impaired as a result of agricultural erosion and runoff. Maintaining forest cover and limiting development and disturbances throughout the forested headwaters of Brush Creek are important for protecting water quality for the dragonfly species of concern. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Damselflies and dragonflies rely on good water quality, although the tolerances of individual species to different types of pollution are not well-understood. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants such as heavy metals, pesticides, and abandoned mine drainage are potential threats to these species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 feet) buffer of native woody vegetation where it exists along the waterways and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Brush Valley Township

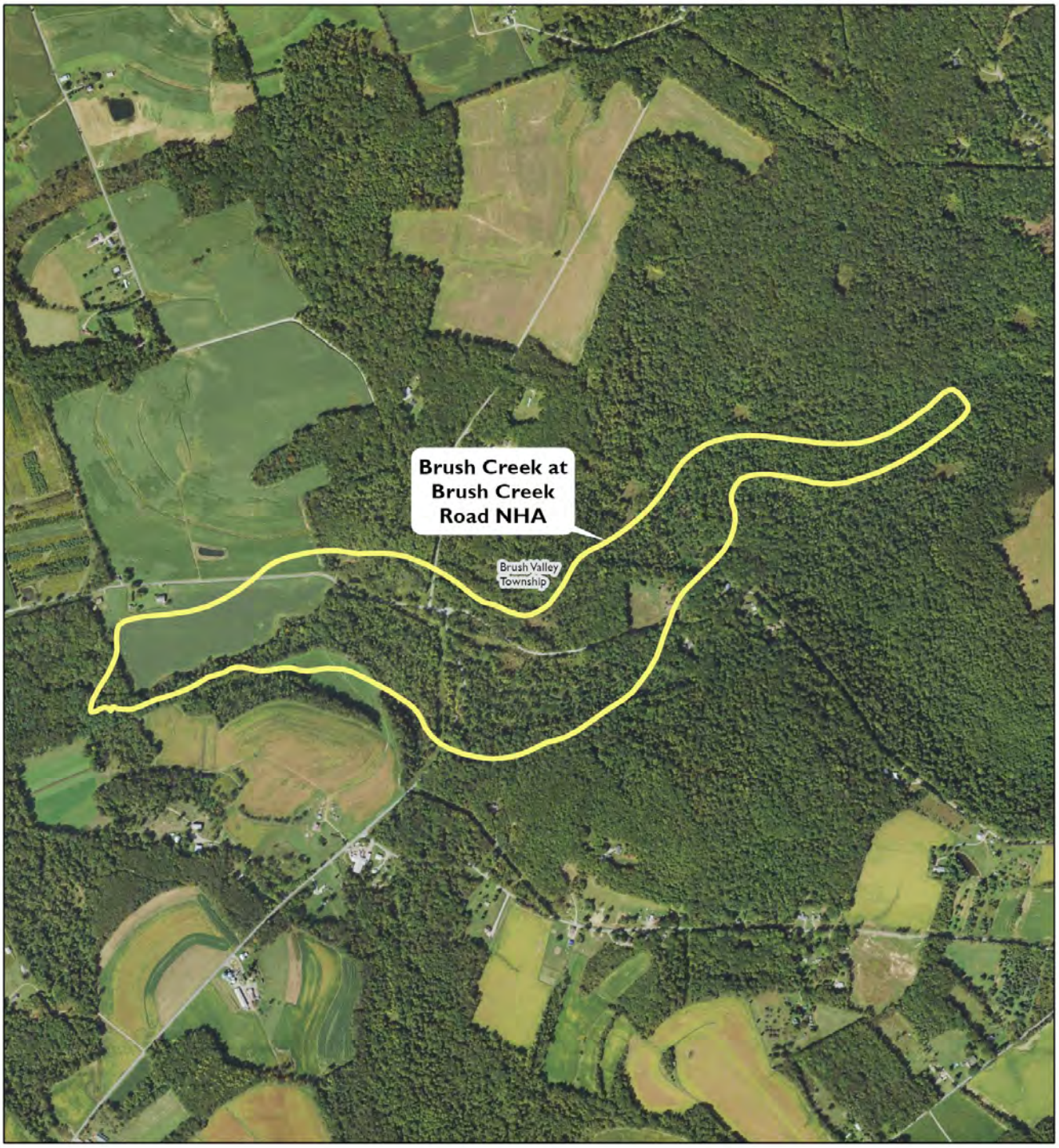
USGS quads: Brush Valley

Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 137 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Brush Creek at Brush Creek Road NHA. Created on 12 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Brush Creek at Brush Creek Road NHA
Brush Valley Township
0 0.1 0.2 0.4 Miles
0 0.13 0.25 0.5 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Cherry Run North NHA

A site of State Significance

A sensitive species of concern was found along this stretch of Cherry Run. Forest along the creek provides a vegetative buffer, which is necessary to maintain high water quality and important shelter and habitat for the species of concern.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site being considered Secure (G5) or Apparently Secure (G4) at the global level, and also sensitive to collection or disturbance. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Within the NHA Core, much of the stream edge has at least some woody vegetation as a buffer from the surrounding agricultural fields, but those buffers are often thin and not adequate to protect against siltation. Although this part of the stream is not classified as impaired, approximately half of the stream reaches upstream of here are impaired by siltation. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- This species has a specific diet and depends on high water quality to maintain stable populations of its food source. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants such as heavy metals, pesticides, and abandoned mine drainage are potential threats to these species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 feet) buffer of native woody vegetation where it exists along the waterways and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Avoid fragmenting the remaining forested areas with additional buildings or infrastructure. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should also be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

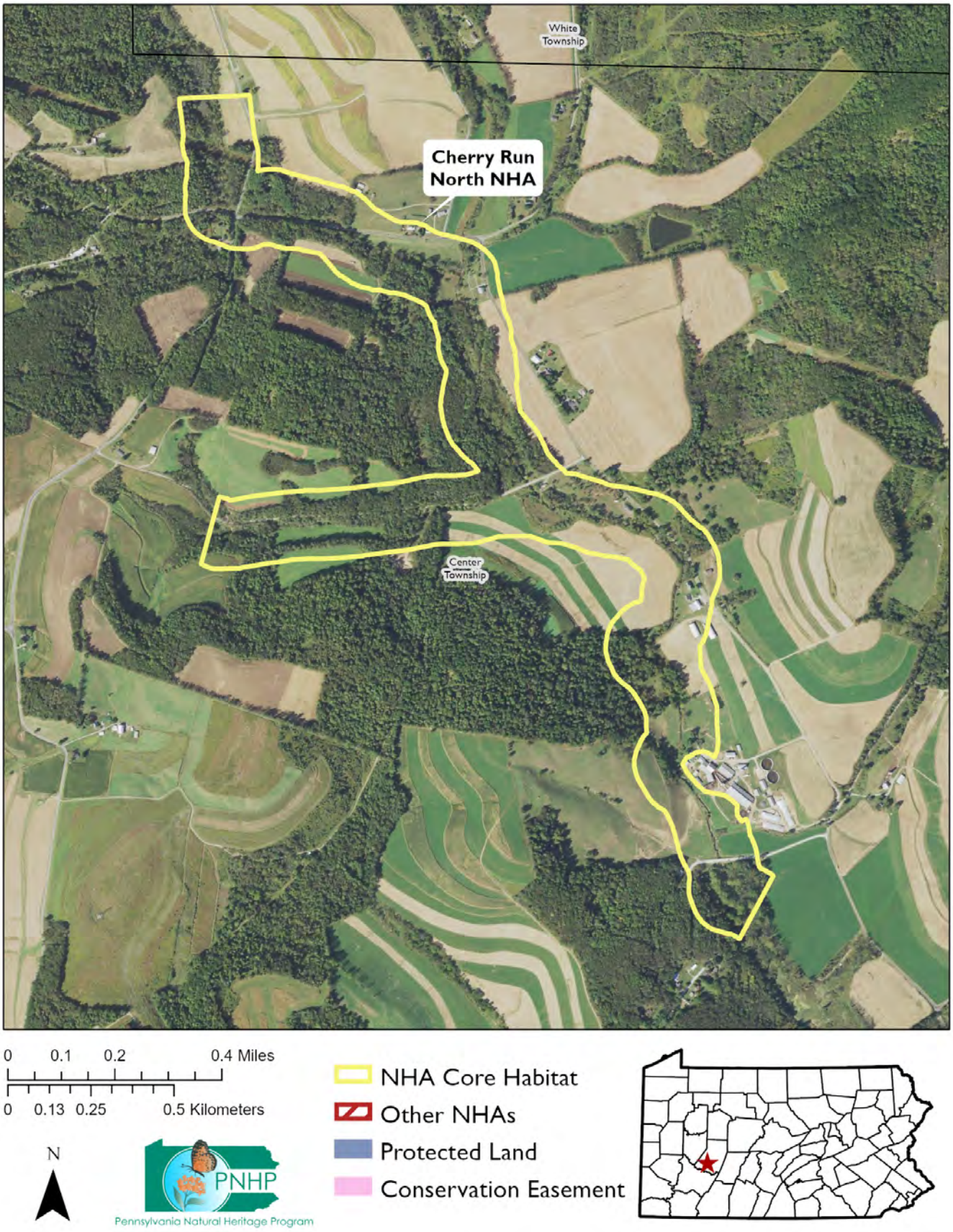
Municipalities: Indiana County: Center Township

USGS quads: Indiana
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 231 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Cherry Run North NHA. Created on 12 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


White Township
Cherry Run North NHA
Center Township
0 0.1 0.2 0.4 Miles
0 0.13 0.25 0.5 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Clyde NHA

A site of Global Significance

Just west of the town of Clyde, a sensitive species of concern was observed in a small patch of forest. This part of Indiana County consists of a matrix of forest patches, urban development, roads, and pipelines. Even small forest patches can be important conservation areas, and care should be taken to preserve mature trees and avoid disturbances associated with recreation or development here.

This site is of Global significance. It has been assigned this significance level because of the presence of a sensitive species of concern that is either of a G1 or G2 rank. Sites designated as Globally Significant are of highest conservation concern within the Commonwealth.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	S	–	–	–	–	2014	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Avoid further fragmentation or disturbance of small forest patches in this area. This includes leaving standing snags intact and not logging mature trees. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- This species relies on intact, interior forest habitat with many large, old trees and standing snags for foraging and roosting. Fragmentation as a result of human developments, or logging, are threats to this species. Avoid the removal of large native trees with naturally exfoliating bark such as shagbark hickory, and allow snags or dying trees to persist upon the landscape as these provide suitable summer roost areas for bats and other animal species.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: West Wheatfield Township

USGS quads: New Florence
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 26 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Clyde NHA. Created on 12 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx

0 0.03 0.07 0.13 Miles

0 0.04 0.07 0.15 Kilometers

N

PNHP

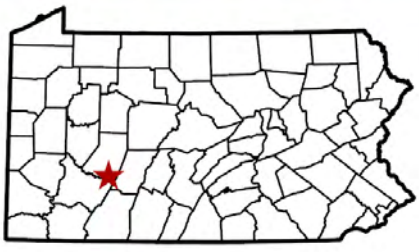
Pennsylvania Natural Heritage Program

NHA Core Habitat

Other NHAs

Protected Land

Conservation Easement



Conemaugh Reservoir NHA

A site of State Significance

This site supports nesting and foraging habitat for a breeding pair of **osprey** (*Pandion haliaetus*) and **bald eagle** (*Haliaeetus leucocephalus*) . The large bend in the Conemaugh River provides the isolation that **osprey** prefer and is directly adjacent to ideal foraging grounds within the mainstem of the river.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Bald eagles are one of two bird species of concern that nest here.
Photo: Steve Gosser

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Bald Eagle (*Haliaeetus leucocephalus*)		G5	S4B,S5N,S4M	DL	PT	2017	E
Osprey (*Pandion haliaetus*)		G5	S3B,S3M	–	PT	2004	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.
[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

The storm water runoff from roadways, suburban development, and agriculture should be considered a potential source of significant contamination for the wetland habitat. Runoff from these sources has significantly higher levels of sediment, nutrients, pesticides, herbicides, and other pollutants than runoff filtered through a natural habitat. Maintaining a high quality aquatic habitat is important to the species of concern found at this location. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Osprey are vulnerable to human disturbance during critical nesting periods. Minimize human activities within 100 meters of nests during the breeding season, and avoid the use of pesticides to control pigeons or other pest bird populations within 2 km of the nest.
- Bald eagles are vulnerable to human disturbance. Significant additional human disturbance within 305 meters (1000 feet) could trigger permanent abandonment of nests, especially if it occurs during the breeding season (December-July).
- Degradation of water quality can have a negative impact on the habitat supporting the species of concern found at this location, and pesticides and other toxins have the potential to bioaccumulate in bird tissue and negatively impact adult health or reproduction (PGC-PFBC (Pennsylvania Game Commission and Pennsylvania Fish & Boat Commission) 2015). Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area, including creating buffers to protect wetlands from upland disturbances.
- Climate change may threaten the persistence of osprey and bald Eagles as they are known to be restricted to cooler habitats, or are at the southern edge of their ranges.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Conemaugh Township; Westmoreland County: Derry Township

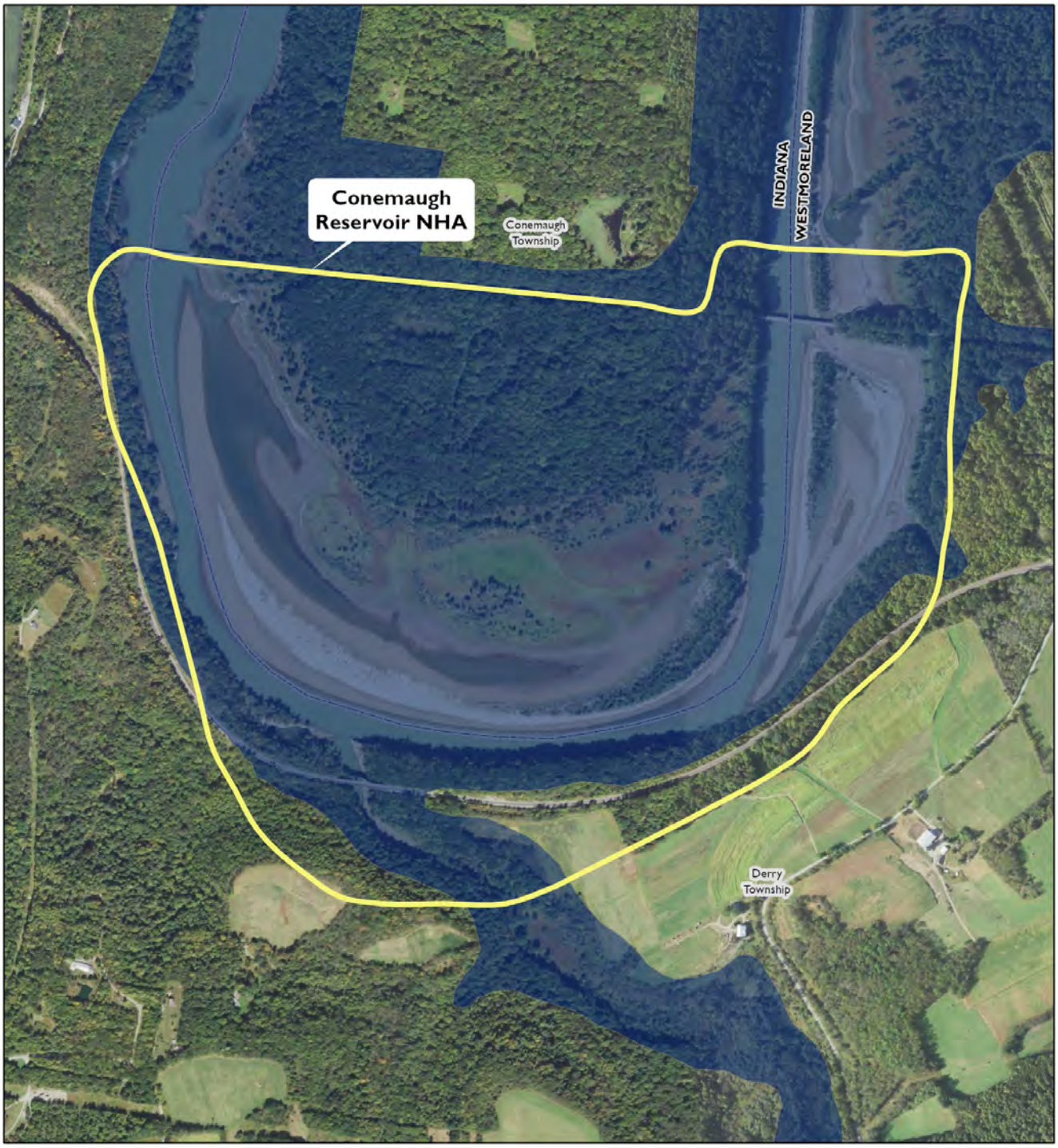
USGS quads: Blairsville
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 525 acres

References

PGC-PFBC (Pennsylvania Game Commission and Pennsylvania Fish & Boat Commission) (2015). *Pennsylvania Wildlife Action Plan 2015-2025*. Harrisburg, Pennsylvania: Pennsylvania Game Commission and Pennsylvania Fish & Boat Commission. URL: http://www.fishandboat.com/Resource/StateWildlifeActionPlan/Pages/default.aspx (visited on 04/16/2018).

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Conemaugh Reservoir NHA. Created on 12 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Conemaugh Reservoir NHA
Conemaugh Township
INDIANA
WESTMORELAND
Derry Township
0 0.07 0.15 0.3 Miles
0 0.1 0.2 0.4 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Conemaugh River at Blairsville NHA

A site of State Significance

A sensitive species of concern was found along this stretch of the Conemaugh River. Relying on clean water to maintain healthy prey populations, this species also uses bushy vegetation along the creek. Streamside vegetation along the creek is necessary for the maintenance of the water quality and to provide critical habitat for the species of concern found at this site. This site also supports the four-toed salamander, (*Hemidactylium scutatum*), an uncommon species which breeds in pools on the floodplain. It lays its eggs in sphagnum moss overhanging the pools, and outside the breeding season it lives in the surrounding upland forest.

Under a blanket of sphagnum moss, this four-toed salamander is guarding its eggs. Photo: Charlie Eichelberger, PNHP

This site is of State significance. It has been assigned this significance level because of the tracked species at the site being considered Secure (G5) or Apparently Secure (G4) at the global level, and also sensitive to collection or disturbance. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status[1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2015	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Riparian vegetation is important to the species of concern as habitat and also as a filter for pollutants. The buffer of streamside forest within the core of the NHA is disturbed only a few roads and ROWs, and appears to be sufficient to maintain the species of concern. Upstream tributaries would benefit from improved riparian buffers. Acid mine drainage remains a problem in this creek. Four-toed salamanders depend on an intact forest adjacent to the breeding habitat, therefore fragmentation of the remaining forest should be avoided. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- The species of concern has a specific diet and depends on high water quality to maintain stable populations of its food source. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants such as heavy metals, pesticides, and abandoned mine drainage are potential threats to these species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 feet) buffer of native woody vegetation where it exists along the waterways and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Avoid fragmenting the remaining forested areas with additional buildings or infrastructure. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should also be applied to the surrounding area.
- A legacy of coal mining impairs this part of Conmaugh Creek through low pH, high levels of metals, and suspended solids. Remediation of the sources of acid mine drainage would improve conditions in the creek.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

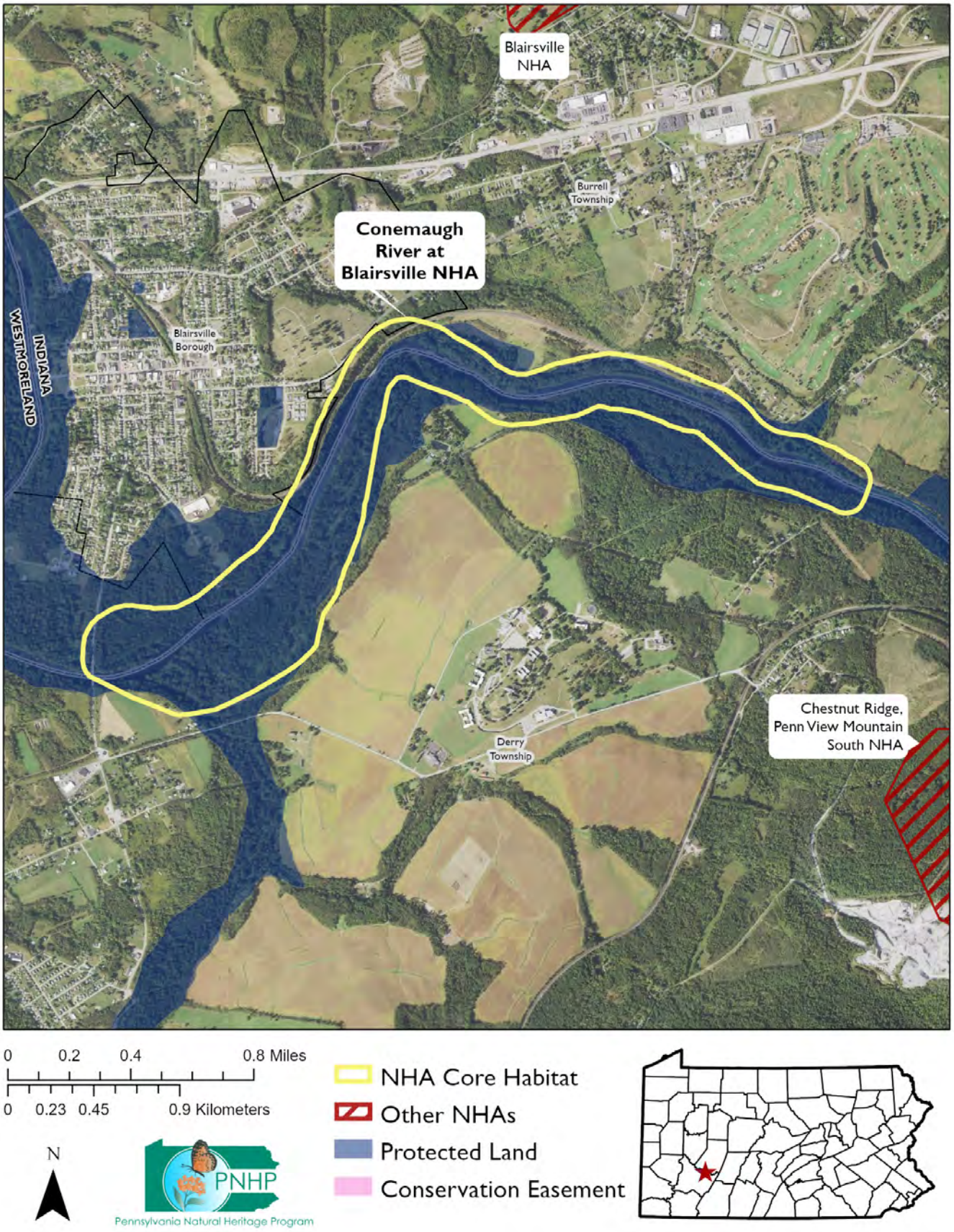
Location

Municipalities: Indiana County: Blairsville Borough, Burrell Township; Westmoreland County: Derry Township
USGS quads: Blairsville, Bolivar
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: Blairsville Swimming Pool And Park
Approximate Acreage: 464 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Conemaugh River at Blairsville NHA. Created on 15 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Blairsville NHA
Burrell Township
Conemaugh River at Blairsville NHA
Blairsville Borough
INDIANA
WESTMORELAND
Chestnut Ridge, Penn View Mountain South NHA
Derry Township
0 0.2 0.4 0.8 Miles
0 0.23 0.45 0.9 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Conemaugh River at Power Plant Rd NHA

A site of State Significance

Great blue heron (*Ardea herodias*) are a wetland generalist species and the largest of the American herons. They tend to nest in colonies of anywhere from a few to thousands of pairs. They generally build nests in trees or other vegetation, but this species will also nest on the ground and almost any structure. Nests are well constructed and reused year to year and may reach a great size after several years. Human disturbances, however, can lead to abandonment of nesting sites.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

A great blue heron stands at the edge of the water. Photo: Brad Georgic, WPC

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status[1]	PABS Status[1]	Last Observed	Quality[2]
Great Blue Heron (*Ardea herodias*)	G5	S5B,S4N,S4M	–	–	2015	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

Large nesting colonies tend to splinter up into smaller ones when disturbed regularly by humans. The number of nests has been observed to be positively related to the area of nearby available foraging habitat. Great blue herons also depend on good water quality, as pollution levels impact prey availability and heron health. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- The great blue heron is vulnerable to human disturbance, especially during the breeding season. Landscape disturbances, including road building, timbering, or other developments can cause large nesting colonies to split up into smaller colonies. Significant additional human disturbance within 305 meters (1000 feet) could trigger permanent abandonment of the area, although disturbance within the Core Habitat should not be a problem for this species if it occurs during the non-breeding season (September – February).
- Degradation of water quality can have a negative impact on the habitat supporting the species of concern found at this location. The stormwater runoff from roadways, suburban development, and agriculture should be considered a potential source of significant contamination for the wetland habitat. Runoff from these sources has significantly higher levels of sediment, nutrients, pesticides, herbicides, and other pollutants than runoff filtered through a natural habitat. Maintaining a high quality aquatic habitat is important to the species of concern found at this location. Improve the water quality and maintain the water quantity of the wetland habitat. Protect and enhance existing aquatic habitats by monitoring water quality and enforcing protections. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area, including creating buffers to protect wetlands from upland disturbances.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

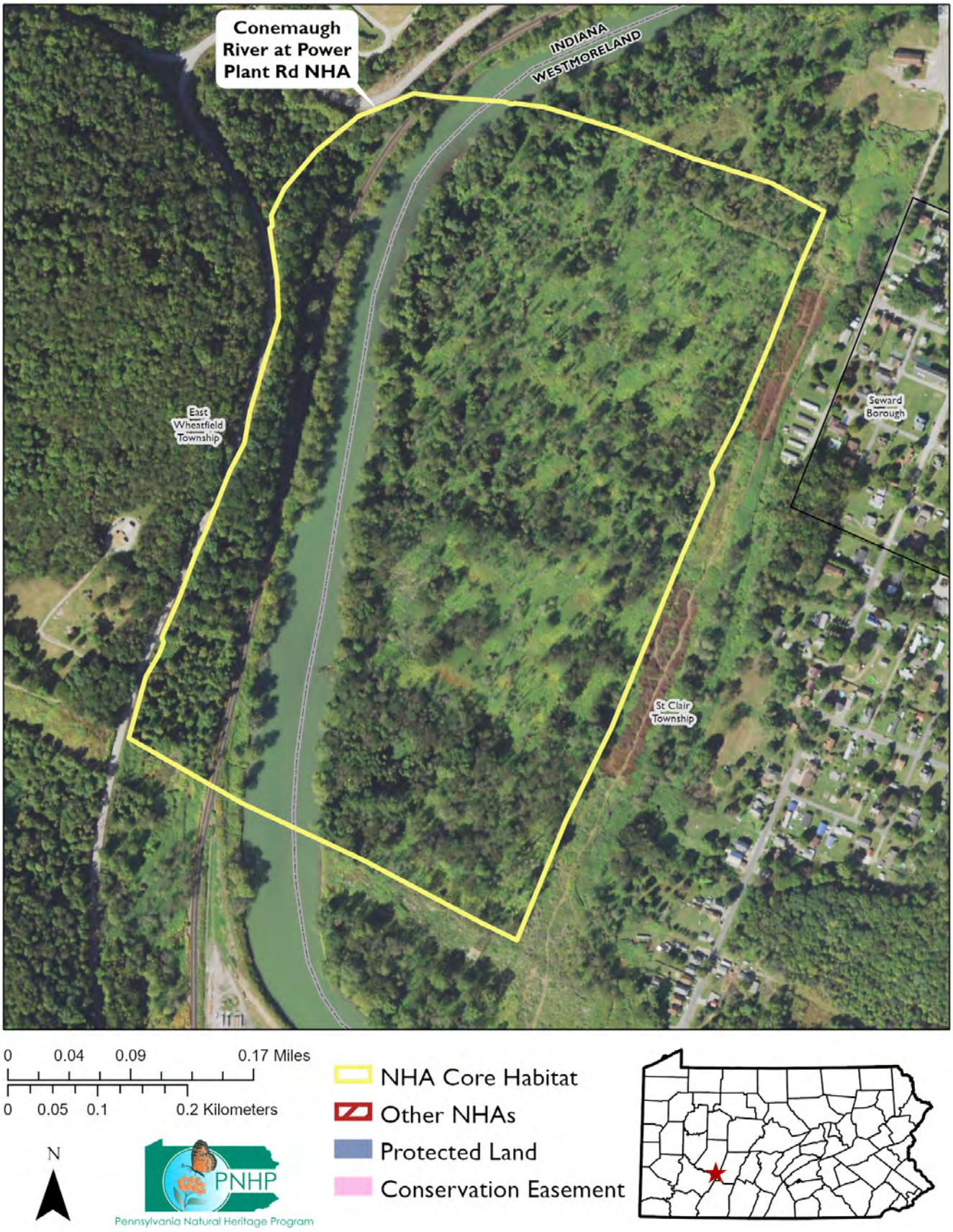
Municipalities: Indiana County: East Wheatfield Township; Westmoreland County: St Clair Township

USGS quads: New Florence
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 108 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Conemaugh River at Power Plant Rd NHA. Created on 12 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Conemaugh River at Power Plant Rd NHA
INDIANA
WESTMORELAND
East Wheatfield Township
Seward Borough
St Clair Township
0 0.04 0.09 0.17 Miles
0 0.05 0.1 0.2 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Conemaugh River at Pumphouse Rd NHA

A site of State Significance

This site is located northeast of New Florence Borough and northwest of Laurel Ridge State Park, Gallitzin State Forest, and State Game Land 42. It is primarily composed of wooded slopes above the Conemaugh River. The southeast corner of the site extends beyond the river to include the wooded floodplain and lower slopes above State Route 711. An unnamed perennial stream runs along the eastern side of the site and an intermittent stream flows through the northwestern corner. Powerline corridors cross through the site, fragmenting the forest. Wet woodlands and wet, herbaceous right-of-way corridors provide habitat for **shining ladies'-tresses** (*Spiranthes lucida*) and a sensitive species of concern that cannot be named at the request of the jurisdictional agency overseeing its protection. Additionally, habitat along the Conemaugh River supports **bald eagle** (*Haliaeetus leucocephalus*).

Shining ladies tresses, a rare orchid species. Photo: Steve Grund, PNHP

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status[1]	PABS Status[1]	Last Observed	Quality[2]
Bald Eagle (*Haliaeetus leucocephalus*)		G5	S4B,S5N,S4M	DL	PT	2015	E
Shining Ladies'-tresses (*Spiranthes lucida*)		G4	S3	N	PT	1999	E
Sensitive Species of Concern A[3]	S	–	–	–	–	2010	CD

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

The forested landscape surrounding Conemaugh River at Pumphouse Road NHA is disturbed by right-of-way corridors, low-density rural residences, scattered agriculture, and dense residential development along the river in Seward and New Florence Boroughs. A coal-powered generating station, which was constructed in the late 1960s, is adjacent to the site. Plant species of concern at this site are threatened by logging, disturbance from off road vehicles, and expansion of development that would convert the existing forested habitat. These disturbances can also impact nesting habitat for the bald eagle through direct habitat loss or nest abandonment, as the species is sensitive to human disturbance near nests during the breeding season. Degraded water quality, which can result from stormwater runoff contaminated with pollutants and sediment, would also affect the quality of habitat for bald eagle. Filling, draining, or other disturbances that would alter the local hydrology would threaten wetlands and other wet areas that the plant species of concern depends on. Some occurrences of this plant species are located within wet, emergent areas of roadsides and powerline corridors. These populations are vulnerable to right-of-way management involving herbicide application and potential encroachment of shrubs and woody vegetation. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Bald eagle is vulnerable to human disturbance. Significant additional human disturbance within 305 meters (1000 feet) could trigger permanent abandonment of the area, especially if it occurs during the breeding season (December – July).
- Conversion of forest to other land uses is a threat. Protect the remaining forested habitat from conversion to housing, pipelines, and other developed land uses.

- Aggressive, non-native plant species are a particular threat to species in calcareous habitats. Left to spread, these species can crowd out shining ladies'-tresses, as well as other native plant species. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try to repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. Continual invasive species monitoring and control will likely be necessary (McPherson 2013).
- Conversion to other land uses by draining or filling of wetlands and aquatic habitats may be a threat to the persistence of plant species of concern at this site. Avoid developments that encroach on remaining wetland communities and aquatic areas. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100-meter (328-foot) buffer of native woody vegetation where it exists along the waterways and wetlands and establish at least a 30-meter (100-foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.
- Degradation of water quality can have a negative impact on the habitat supporting bald eagles, and pesticides and other toxins have the potential to bioaccumulate in bird tissue and negatively impact adult health or reproduction (PGC-PFBC (Pennsylvania Game Commission and Pennsylvania Fish & Boat Commission) 2015). The stormwater runoff from roadways, suburban development, and agriculture should be considered a potential source of significant contamination for the wetland habitat. Runoff from these sources has significantly higher levels of sediment, nutrients, pesticides, herbicides, and other pollutants than runoff filtered through a natural habitat. Maintaining a high-quality aquatic habitat is important to the species of concern found at this location. Improve the water quality and maintain the water quantity of the wetland habitat. Protect and enhance existing aquatic habitats by monitoring water quality and enforcing protections. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area, including creating buffers to protect wetlands from upland disturbances.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: East Wheatfield Township, West Wheatfield Township; Westmoreland County: St Clair Township
USGS quads: New Florence
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 515 acres

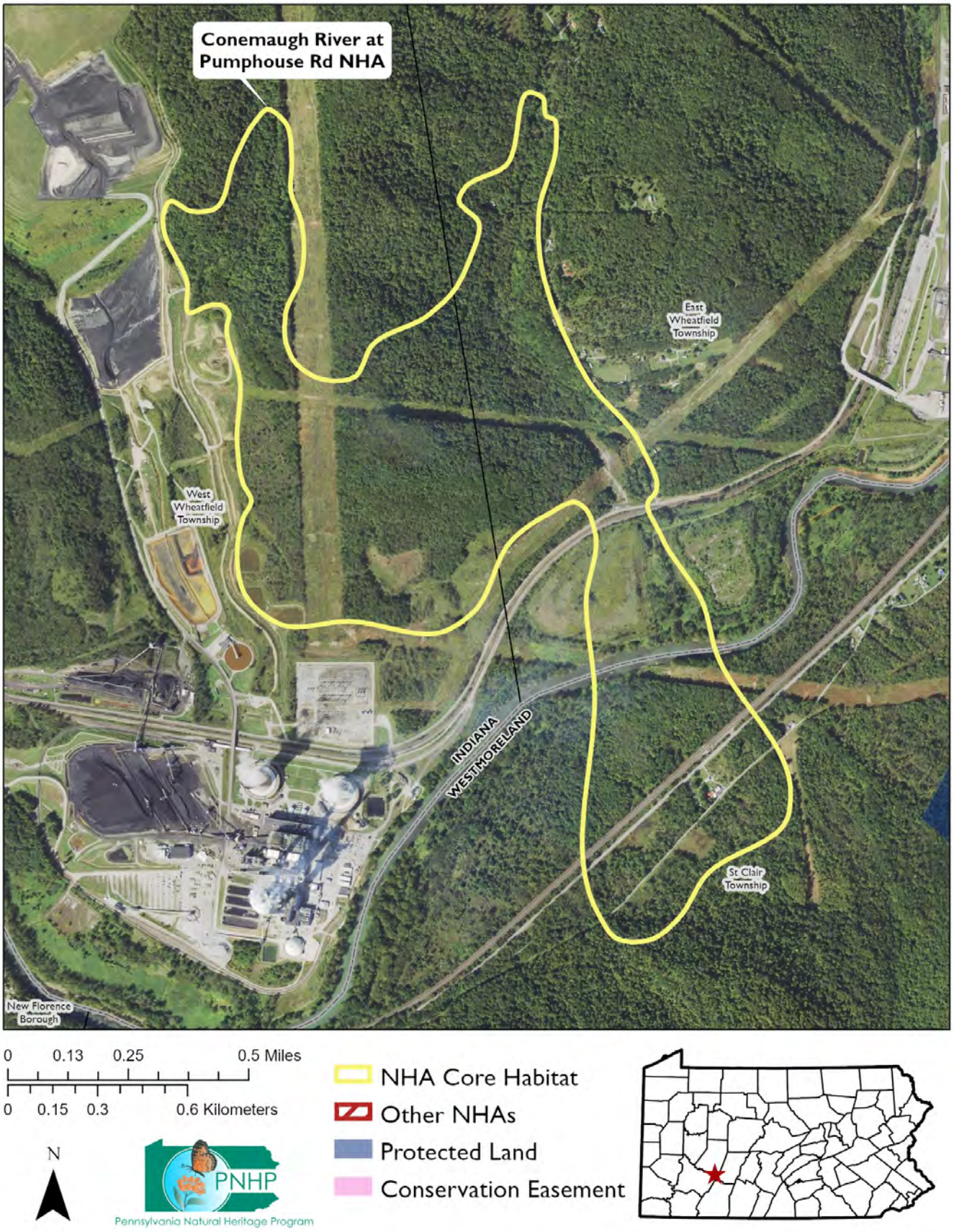
References

McPherson, J. I. (2013). *Conservation Assessment of Calcareous Ecosystems*. Report to Wild Resources Conservation Program Grant #10391. Pittsburgh, Pennsylvania: Pennsylvania Natural Heritage Program, p. 152.

PGC-PFBC (Pennsylvania Game Commission and Pennsylvania Fish & Boat Commission) (2015). *Pennsylvania Wildlife Action Plan 2015-2025*. Harrisburg, Pennsylvania: Pennsylvania Game Commission and Pennsylvania Fish & Boat Commission. URL: http://www.fishandboat.com/Resource/StateWildlifeActionPlan/Pages/default.aspx (visited on 04/16/2018).

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Conemaugh River at Pumphouse Rd NHA. Created on 15 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Conemaugh River at Pumphouse Rd NHA
East Wheatfield Township
West Wheatfield Township
INDIANA
WESTMORELAND
St Clair Township
New Florence Borough
0 0.13 0.25 0.5 Miles
0 0.15 0.3 0.6 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Cramer Pike NHA

A site of State Significance

This site supports a sensitive species of concern. The species occurs in a small wetland in a right-of-way, where the open canopy may help it persist. The species might also be present in other wetlands and seeps along the stream valley. The wetland includes a variety of species, including skunk cabbage (*Symplocarpus foetidus*), jewelweed (*Impatiens* spp.), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), swamp aster (*Symphyotrichum puniceum*), fringed sedge (*Carex crinita*), lurid sedge (*Carex lurida*), awl-fruited sedge (*Carex stipata*), northern long sedge (*Carex folliculata*), common rush (*Juncus effusus*), rice cut-grass (Leerzia oryzoides), and fowl mannagrass (*Glyceria striata*).

This site is of State significance. It has been assigned this significance level because of the tracked species at the site being considered Secure (G5) or Apparently Secure (G4) at the global level, and also sensitive to collection or disturbance. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2012	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Disturbances should be minimized at this site. The surrounding forest should be left intact. Invasive species are a potential concern at this site, especially since a new ROW was recently cleared 70 meters from the species of concern. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Conversion of the surrounding forest to other land uses is a threat. Protect the remaining habitat from conversion to housing, pipelines, and other land uses.
- Invasive exotic plant species crowd out native plants if left unchecked. Japanese stilt grass (*Microstegium* vinineum) is present at this site, although as an upland plant it will not directly affect this wetland. Invasive wetland plants should be watched for, and eradicated if found.
- The wetland is probably fed by groundwater. By avoiding large withdrawals of groundwater, groundwater levels can be maintained. Groundwater quality can be compromised by septic systems and agricultural fertilizers and pesticides.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

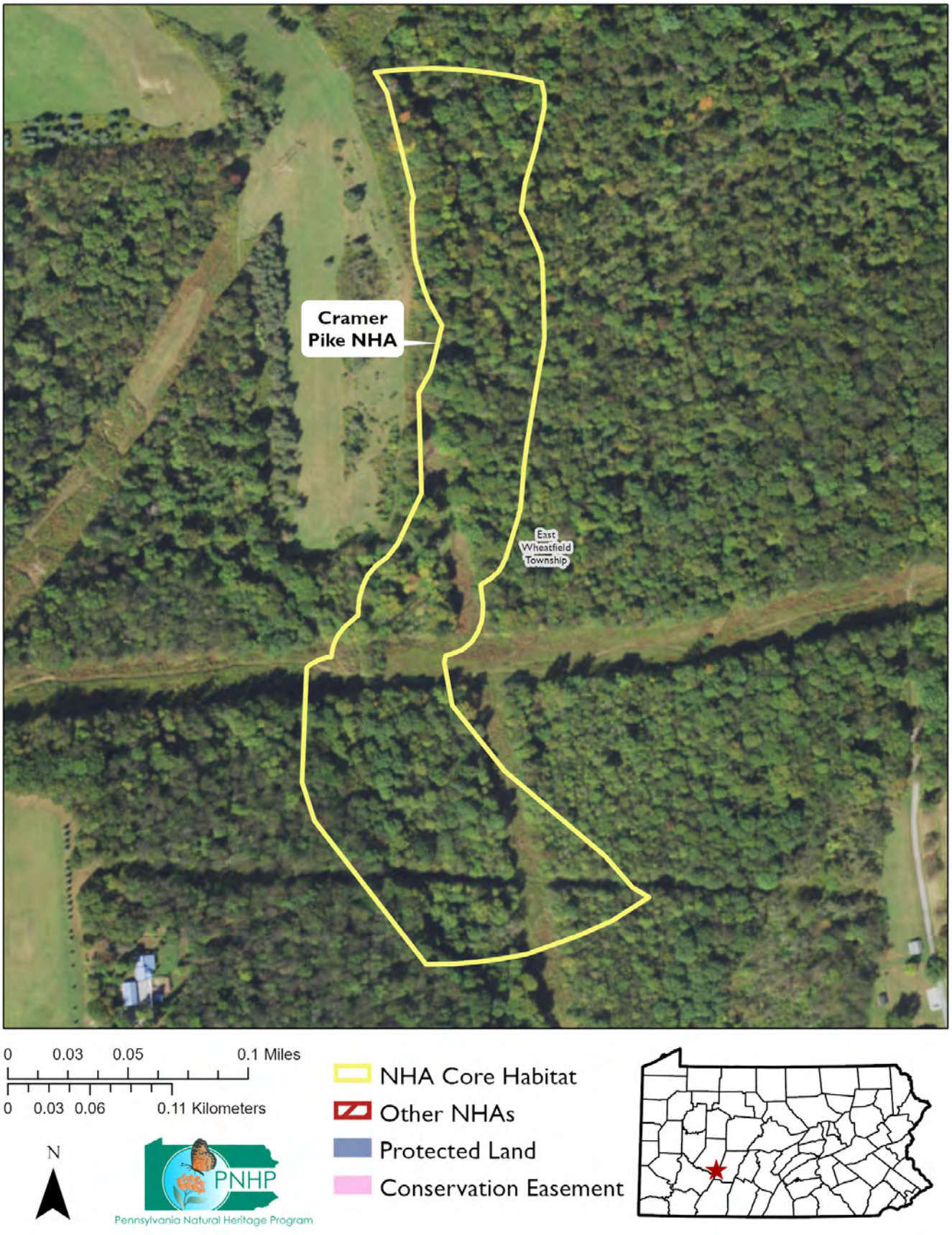
Municipalities: Indiana County: East Wheatfield Township

USGS quads: Vintondale
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 1 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Cramer Pike NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Cramer
Pike NHA
East
Wheatfield
Township
0 0.03 0.05 0.1 Miles
0 0.03 0.06 0.11 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Crooked Creek at Creekside NHA

A site of State Significance

This NHA encompasses approximately three and a half miles of Crooked Creek west of Creekside. This stretch is primarily forested, but has been fragmented by agricultural fields and a mining operation. The western end of this NHA is characterized as a sugar maple – mixed hardwood floodplain forest. Sugar maple (*Acer saccharum*) is the dominant tree, with silver maple (*Acer saccharinum*), shagbark hickory (*Carya ovata*), and other hardwoods present in lesser amounts.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sugar Maple - Mixed Hardwood Floodplain Forest	C	GNR	S4	–	–	2014	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.
[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

The natural community of concern at this site is a mature, diverse, and intact example of a sugar maple – mixed hardwood floodplain forest with minimal invasive species. This area should be allowed to remain as undisturbed as possible. Do not clear additional forested habitat and allow cleared areas to regenerate with native species where possible. Monitor for invasive species and remove those already present. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Overstory clearing, as a result of logging or development, is a threat to this community. Avoid developments in the floodplains, which directly impact this community and lead to critical habitat loss. Conduct any timber activities according to best management practices.
- Aggressive non-native plant species are a potential threat. Left to spread, these species can crowd out the species of concern, as well as other native plant species. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try to repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. Continual invasive species monitoring and control will likely be necessary.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

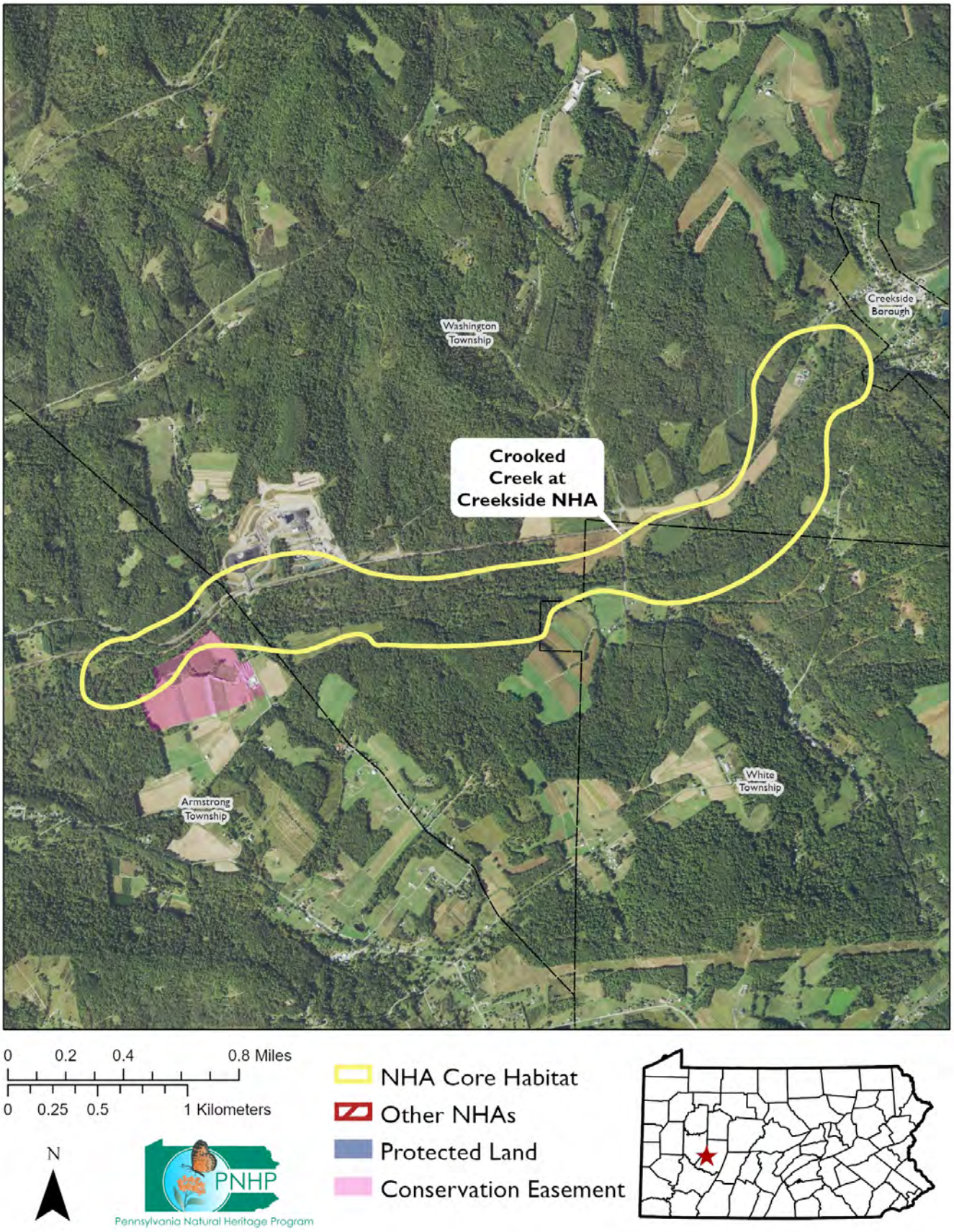
Location

Municipalities: Indiana County: Washington Township, White Township, Creekside Borough, Armstrong Township
USGS quads: Ernest
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 512 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Crooked Creek at Creekside NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Washington Township
Creekside Borough
Crooked Creek at Creekside NHA
Armstrong Township
White Township
0 0.2 0.4 0.8 Miles
0 0.25 0.5 1 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Curry Run NHA

A site of State Significance

A small stream of moderate gradient supports a population of **least brook lamprey** (*Lampetra aepyptera*). The streambed is a mix of rubble, with silt and sand deposits in pools, and the canopy is partially closed over the stream bed. A number of other small freshwater fish species occur here as well, including minnows, suckers, and creek chub. **Least brook lamprey** spend 5-6 years in a larval stage, during which they feed on tiny particles of organic matter. Once they metamorphose into adults, in the late summer, they overwinter, spawn, and then die. Adult **least brook lamprey** do not eat at all!

The least brook lamprey is not parasitic, unlike other, more well-known lamprey species. Photo: Fredlyfish4 (https://commons.wikimedia.org/wiki/File:Lampetra_aepyptera_UMFS_1.JPG)

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Least Brook Lamprey (*Lampetra aepyptera*)	G5	S4	PC	CR	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.
[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

Protect water quality in this small stream to protect the fish species of concern which is found here. Sedimentation as a result of erosion and climate change-driven shifts in water levels pose the greatest threats. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads, reducing habitat quality for this fish species. Conserve and expand the forested riparian buffers of this waterway. Streams through forested areas should be considered high priority for conservation. The forested riparian corridor helps to regulate the temperature of the stream and creates streamside conditions that contribute to improved water quality and aquatic habitat. Streams through non-forested areas should be restored with native trees and shrubs appropriate to the habitat. Establish at least a 100 foot buffer of woody vegetation along the creek and its tributaries to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.
- Increased drought, as a result of climate change, could lead to decreased water levels and reduce habitat availability for this fish. Minimize other threats to maximize this species' resiliency to climate change. Create a plan for assessing predicted and current climate change impacts to water levels in the aquatic habitats this species relies on in Pennsylvania.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Armstrong Township

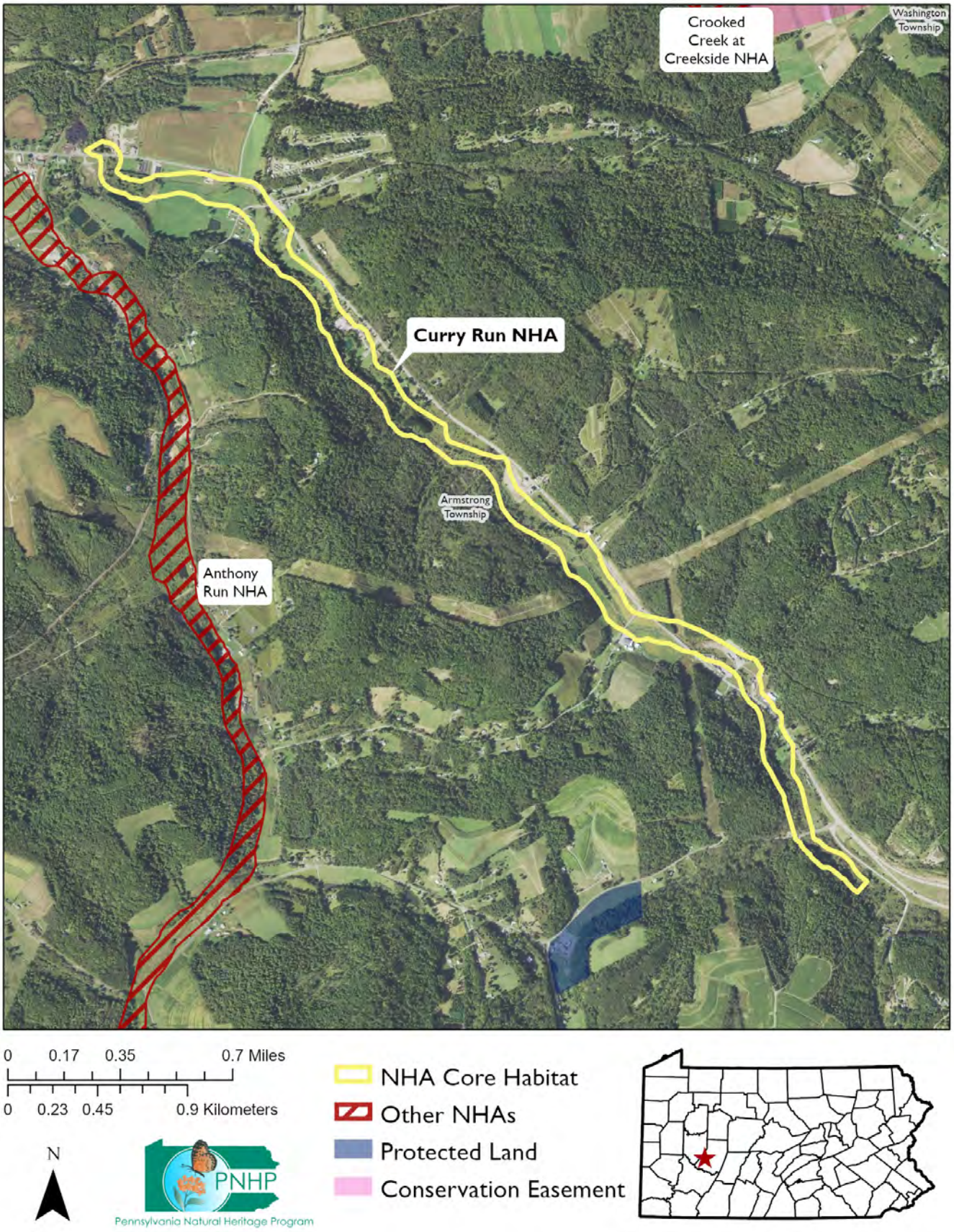
USGS quads: Elderton, Ernest, Indiana

Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 165 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Curry Run NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Crooked Creek at Creekside NHA
Washington Township
Curry Run NHA
Armstrong Township
Anthony Run NHA
0 0.17 0.35 0.7 Miles
0 0.23 0.45 0.9 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

East Pike NHA

A site of State Significance

This forested hillside above Two Lick Reservoir provides foraging and nesting habitat for **bald eagle**s (*Haliaeetus leucocephalus*). The core of the NHA is located entirely within State Game Land 248.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

A bald eagle. Photo: Steve Gosser

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Bald Eagle (*Haliaeetus leucocephalus*)	G5	S4B,S5N,S4M	DL	PT	2016	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

Bald eagles are susceptible to disturbance during the active nesting season (January through July). The avoidance measures and recommendations below should be adopted within this NHA to assure that this nest remains viable. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- The U.S. Fish and Wildlife Service (USFWS) recommend a 200 meter buffer from the nest for agricultural activity. Avoiding agricultural activities within that buffer will reduce the likelihood that the eagles will abandon the nest. The USFWS also recommends a 100 meter buffer from the nest for passive recreation and general human activity. Human activity within that buffer would likely disturb nesting eagles and may cause them to abandon the nest. If using off-road vehicles or equipment, the USFWS recommends that humans stay at least 100 meters from the nest. In open areas, where there is increased visibility and exposure to noise, stay at least 200 meters from the nest (Service 2007).
- Protect potential roost and nest sites by retaining mature trees and old growth stands, particularly within one half mile from water.
- Do not intentionally feed bald eagles. Artificially feeding bald eagles can disrupt their essential behavioral patterns and put them at increased risk from power lines, collision with windows and cars, and other human-induced mortality factors. To avoid poisoning, use pesticides, herbicides, fertilizers, and other chemicals only in accordance with federal and state laws.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: White Township, Cherryhill Township

USGS quads: Brush Valley
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: State Game Land 248

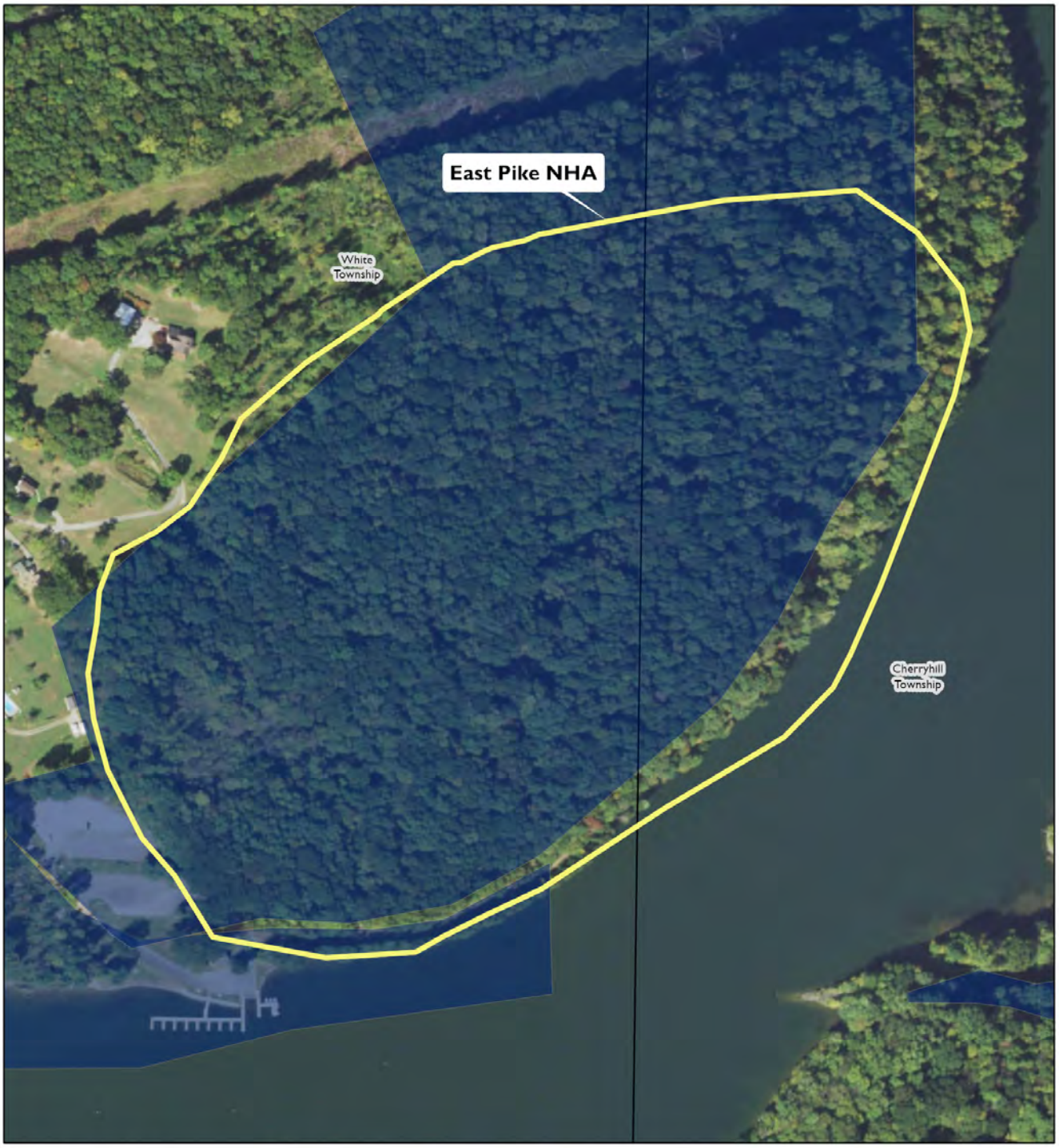
Approximate Acreage: 55 acres

References

Service, U.S. Fish {and} Wildlife (May 2007). *National bald eagle management guidelines*. URL: https://www.fws.gov/northeast/ecologicalservices/pdf/NationalBaldEagleManagementGuidelines.pdf (visited on 05/02/2018).

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. East Pike NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


East Pike NHA
White Township
Cherryhill Township
0 0.03 0.06 0.12 Miles
0 0.03 0.07 0.13 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Findley Run Slope NHA

A site of Regional Significance

Findlay Run Slope NHA lies almost entirely within Gallitzen State Forest, including the Charles F. Lewis Natural Area. This NHA is largely forested, except for two right-of-ways that cross through the area. This is a mixed hardwood forest dominated by sweet birch (*Betula lenta*), black locust (*Robinia pseudoacacia*), fire cherry (*Prunus pensylvanica*), sassafras (Sassifras albidum), red maple (*Acer rubrum*), and black gum (*Nyssa sylvatica*). The steep, rocky hillsides provide habitat for **Allegheny woodrat**s (*Neotoma magister*). Clark Run flows through here before entering into the Conemaugh River. **Mountain bugbane** (*Actaea podocarpa*), a plant species of concern, was also found along the forested slopes.

This site is of Regional significance. It has been assigned this significance level because of the occurrence of at least one globally vulnerable (G3) species, such as Allegheny Woodrat (*Neotoma magister*), within this NHA.

Mountain bugbane (*Actaea podocarpa*) flower Photo: PNHP

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Allegheny Woodrat (*Neotoma magister*)		G3G4	S2	PT	PT	1993	E
Mountain Bugbane (*Actaea podocarpa*)		G4	S3	PT	PR	2007	BC

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

Being situated within a state forest and designated natural area will provide protection for this habitat and the species of concern within it. Both rare species require relatively undisturbed forest habitats. The right-of-ways and adjacent housing development may impact the area by creating disturbances that could negatively affect the neighboring forest. Care should be taken with right-of-way management to reduce impacts. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- The decline of the American chestnut (*Castanea dentata*) after the introduction of chestnut blight (*Endothecia parasitica*) is thought to have played a role in the decline of Allegheny woodrats. These trees were formerly an important food source for woodrats, producing a much more reliable crop of nuts than other trees. Blight-resistant American chestnut trees should be planted at this site, and the survival of the trees should be monitored to ensure the success of the reintroduction. For more information, see the website of resources on the American chestnut maintained by the Pennsylvania chapter of The American Chestnut Foundation (PA-TACF 2019).
- Raccoon roundworm (*Baylisascaris procyonis*) is prevalent in many parts of Pennsylvania, and is often lethal to Allegheny woodrats. Raccoons are the primary host for the worm, but domestic dogs can also carry it. Roundworm levels in raccoons near this site should be monitored, and if levels are high then a program to treat raccoons with drugged bait pellets could be initiated.
- Acorns are a major part of the diet of Allegheny woodrats, but their production can be reduced by gypsy moths (*Lymantria dispar*), an introduced species that eats the leaves of oaks and other trees. Oaks may be stressed by the moths, reducing their crops of acorns, or they may be killed after several rounds of defoliation. Gypsy moths should be monitored at this site, and if present at high levels control methods should be considered. For more information on gypsy moth control methods, see the Pennsylvania Department of Conservation Natural Resources' maintained webpage on gypsy moth management (Pennsylvania Department of Conservation Natural Resources 2019).

- Allegheny woodrats require rocky habitat which provides appropriate food sources as well as protection from the predators found in more open habitats such as forest edges (e.g. hawks, raccoons, dogs, etc.). Loss of buffer forest, changes in food availability, or introduction pathways for predators could impact their populations negatively. Creation of mines, quarries, and roads can directly remove the rocky habitat needed by woodrats. Avoid mining or quarrying projects at this site, as well as other disturbances within one km of the NHA core, as woodrats are sensitive to fragmentation and habitat loss.
- Mountain bugbane depends on relatively undisturbed, rich hardwood forests. Development and logging activities are the primary threats to this species. Protect remaining habitat from fragmentation and conversion to housing, pipelines, and other land uses. For more information about the status of forested land in Pennsylvania, see Albright et al. (2017).

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: East Wheatfield Township

USGS quads: Vintondale
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: Charles F. Lewis Natural Area, Gallitzin State Forest
Approximate Acreage: 99 acres

References

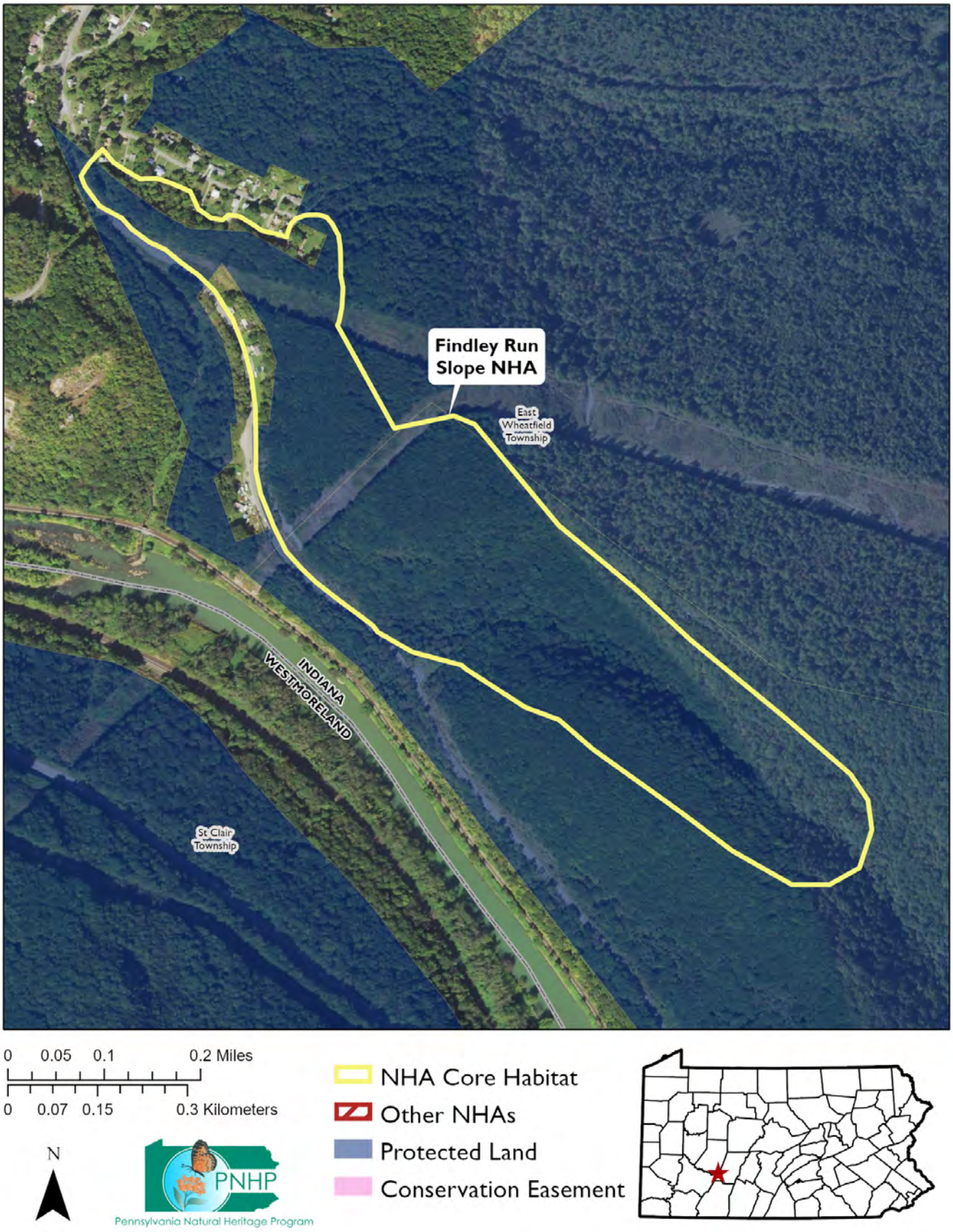
Albright, Thomas A. et al. (2017). *Pennsylvania forests 2014*. NRS-RB-111. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. DOI: 10.2737/NRS-RB-111. URL: https://www.nrs.fs.fed.us/pubs/54420 (visited on 01/30/2019).

PA-TACF (2019). *Resources and Links – PA/NJ Chapter of The American Chestnut Foundation PA*. URL: https://patacf.org/membership/resources/ (visited on 01/31/2019).

Pennsylvania Department of Conservation Natural Resources (2019). *Gypsy Moth*. Pennsylvania Department of Conservation Natural Resources. URL: https://www.dcnr.pa.gov:443/Conservation/ForestsAndTrees/InsectsAndDiseases/GypsyMoth/Pages/default.aspx (visited on 01/30/2019).

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Findley Run Slope NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Findley Run
Slope NHA
East
Wheatfield
Township
INDIANA
WESTMORELAND
St Clair
Township
0 0.05 0.1 0.2 Miles
0 0.07 0.15 0.3 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

High Rise Drive NHA

A site of Global Significance

This site is located north of Blairsville, south of Blacklick Creek, and along the eastern side of S.R. 217. The NHA is a forested patch among a landscape of agriculture and residential development. The overstory of this young forest is dominated by red maple (*Acer rubrum*). This forest fragment provides habitat for a sensitive species of concern that cannot be named at the request of the jurisdictional agency overseeing its protection.

This site is of Global significance. It has been assigned this significance level because of the presence of a sensitive species of concern that is either of a G1 or G2 rank. Sites designated as Globally Significant are of highest conservation concern within the Commonwealth.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2014	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

This site is adjacent to farmland, roadways, and residential development. A utility corridor, constructed after 2015, bisects the site. The sensitive species of concern at this site depends upon large tracts of forested habitat and is vulnerable to expanded development. This species is particularly vulnerable to tree clearing or timber harvesting during times of year when the young lack full mobility. This species is also threatened removal of snags within the forest, which are important to maintaining high-quality habitat, and broadcast pesticide application. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- This species relies on intact, interior forest habitat with many large, old trees and standing snags for foraging and roosting. Fragmentation as a result of human developments, or logging, are threats to this species. Avoid the removal of large native trees with naturally exfoliating bark such as shagbark hickory, and allow snags or dying trees to persist upon the landscape as these provide suitable summer roost areas for bats and other animal species.
- This species' foraging may be disrupted by artificial lights. Reduce light pollution, particularly during mid-spring through mid-fall. Where outdoor lights are necessary, angle lights downward or minimize light directed into the sky through other measures.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Burrell Township

USGS quads: Blairsville

Previous CNHI reference: This site does not overlap a previously published site.

Associated NHAs: This site is not directly associated with another NHA.

Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.

Approximate Acreage: 61 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. High Rise Drive NHA. Created on 13 Jan 2021.
Available at: http://www.naturalheritage.state.pa.us/inventories.aspx

0 0.03 0.07 0.13 Miles

0 0.04 0.07 0.15 Kilometers

N

PNHP

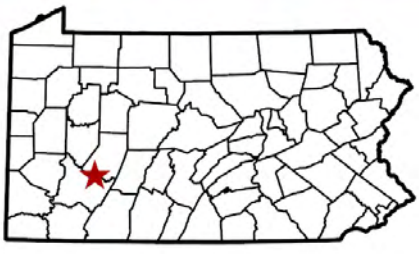
Pennsylvania Natural Heritage Program

NHA Core Habitat

Other NHAs

Protected Land

Conservation Easement



Jericho Rd NHA

A site of State Significance

The forested slopes above East Branch Richards Run support a mid-successional stand of sugar maple (*Acer saccharum*) and tuliptree (*Liriodendron tulipifera*), along with a mixture of other hardwood trees, including black cherry (*Prunus serotina*) and black birch (*Betula lenta*). The shrubs are primarily spicebush (*Lindera benzoin*). Gaps in the forest canopy created from old logging roads and natural tree falls provide suitable habitat for a large population of **leaf-cup** (*Smallanthus* uvedalius), a rare plant species that grows in ravines and moist thickets over base rich soils.

Leaf-cup is a rare plant that grows in the rich soils at this site. Photo: WPC

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Leaf-cup (*Smallanthus uvedalia*)	G4G5	S3	N	PR	2011	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

The rich soils at this site facilitate rapid invasions of non-native plants, especially along disturbed edges created from logging roads or natural gaps in the forest canopy. Because leaf-cup also prefers base rich soils, invasive plant species pose the most significant threat to long-term viability of this rare species at the site. Left to spread, invasive species can crowd out the species of concern, as well as other native plant species. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Aggressive non-native plant species are a particular threat to species in base rich (calcareous) habitats. Invasive species know to be present at this site include *Microstegium vimineum*, *Fallopia japonica*, *Rosa multiflora*, and *Ailanthus altissima*. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: West Wheatfield Township

USGS quads: New Florence

Previous CNHI reference: This site does not overlap a previously published site.

Associated NHAs: This site is not directly associated with another NHA.

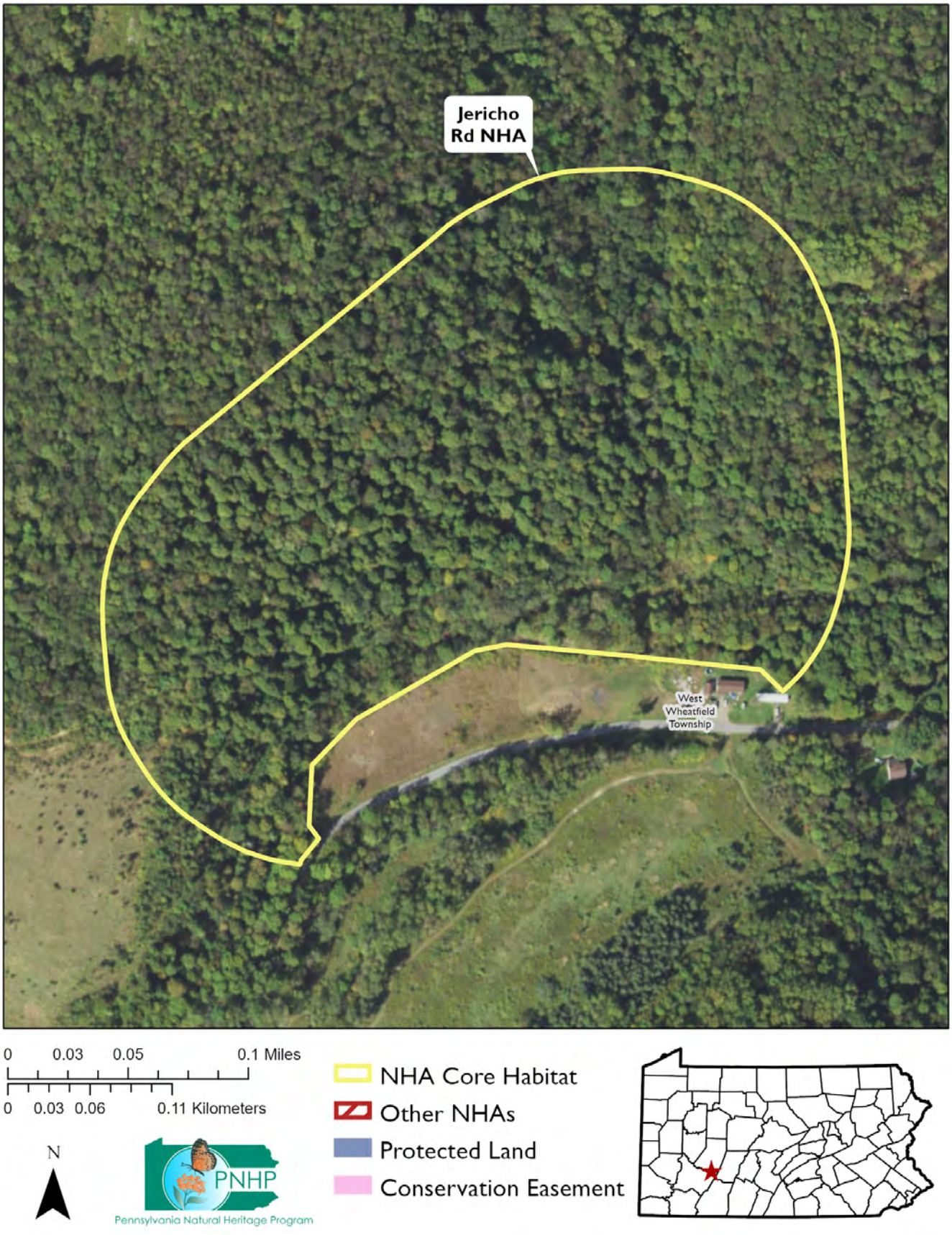
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.

Approximate Acreage: 35 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Jericho Rd NHA. Created on 15 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Jericho
Rd NHA
West
Wheatfield
Township
0 0.03 0.05 0.1 Miles
0 0.03 0.06 0.11 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Jessie Penrose Road NHA

A site of Global Significance

Jessie Penrose Road NHA is a small, approximately 10 acre patch of wooded habitat. It is bordered by additional forested habitat, agricultural fields, and a utility right-of-way. Residential areas also occur in the surrounding area. Surveys identified a population of a sensitive species of concern.

This site is of Global significance. It has been assigned this significance level because of the presence of a sensitive species of concern that is either of a G1 or G2 rank. Sites designated as Globally Significant are of highest conservation concern within the Commonwealth.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2014	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Further disturbance to the wooded areas may reduce the available habitat. Allow regeneration of native species where possible. Agricultural and residential land use near the wooded habitat may impact insect populations with pesticide use and should be limited. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- This species relies on intact, interior forest habitat with many large, old trees and standing snags for foraging and roosting. Fragmentation as a result of human developments, or logging, are threats to this species. Avoid the removal of large native trees with naturally exfoliating bark such as shagbark hickory, and allow snags or dying trees to persist upon the landscape as these provide suitable summer roost areas.
- This species' foraging may be disrupted by artificial lights. Reduce light pollution, particularly during mid-spring through mid-fall. Where outdoor lights are necessary, angle lights downward or minimize light directed into the sky through other measures.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

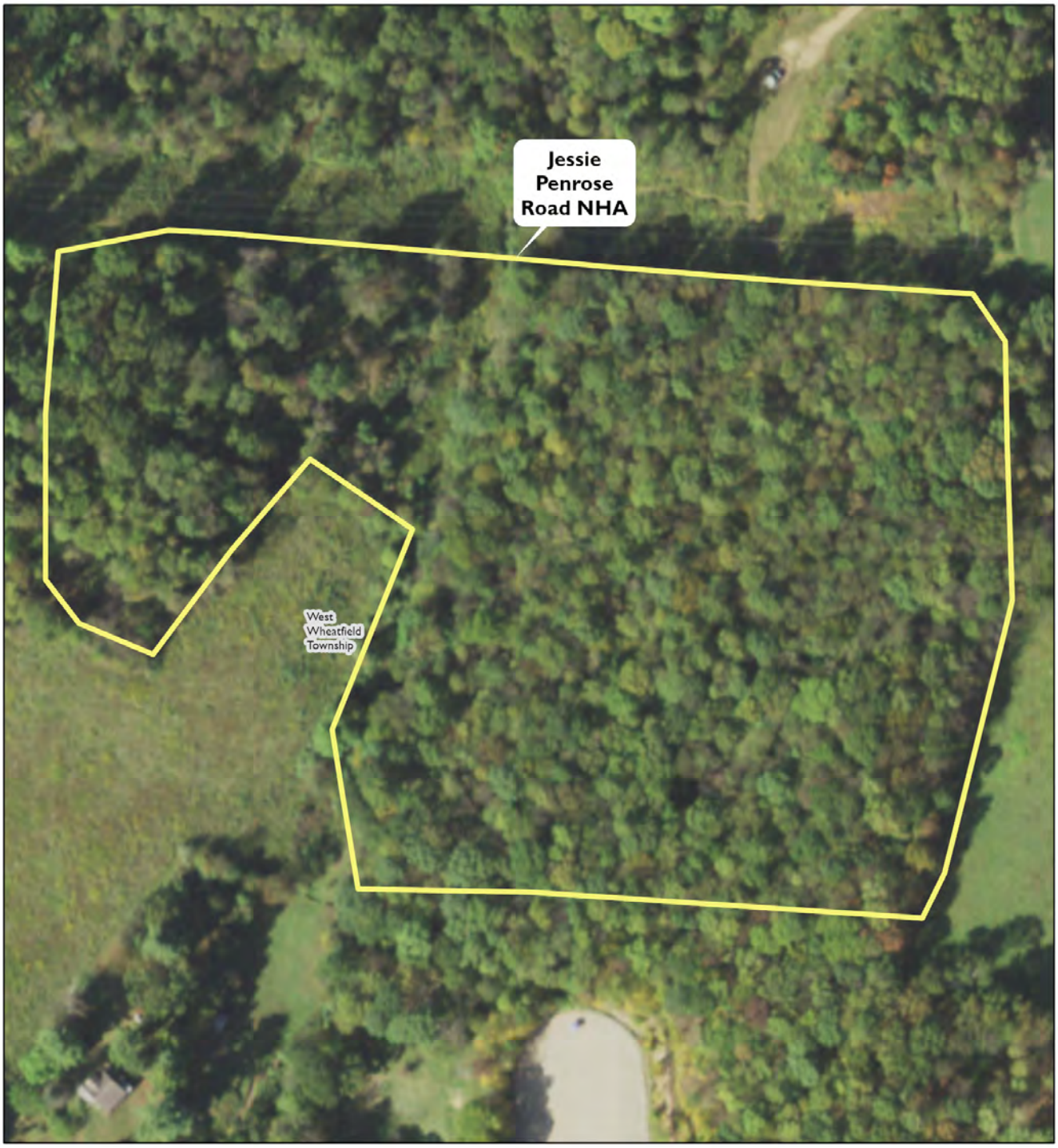
Municipalities: Indiana County: West Wheatfield Township

USGS quads: Bolivar
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 11 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Jessie Penrose Road NHA. Created on 14 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Jessie Penrose Road NHA
West Wheatfield Township
0 0.01 0.03 0.05 Miles
0 0.01 0.03 0.05 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Johnsonburg NHA

A site of State Significance

Johnsonburg NHA is a mix of forest and agricultural fields, with planted Norway spruce along the field edges. State Game Land 147 is located on the eastern side of the NHA. It is mostly forested, but has been fragmented with numerous scattered natural gas wells. This area of upland forest and fields supports breeding for a sensitive species of concern. This species requires a combination of forested and grassland/scrubland habitats to successfully breed.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site being considered Secure (G5) or Apparently Secure (G4) at the global level, and also sensitive to collection or disturbance. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

This species is susceptible to disturbance during the breeding season. Additionally, it requires mature forest next to grassland/shrubland habitat, and if this mix of habitats becomes unavailable it will vacate the area. Maintaining a buffer from disturbance during the breeding season is necessary to maintain this species. Additionally, if the mix of mature forest next to grassland and shrubland is lost to logging or succession, the species will be lost from the area. Intensification of agriculture in the area could make the habitat unsuitable. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Climate change may threaten the persistence of the sensitive species of concern, as it is known to be restricted to cooler habitats, or is at the southern edge of its range. A CCVI analysis, which would evaluate this likelihood, has not been conducted. Minimize other threats to maximize this species' resiliency to climate change. To read a more detailed summary of this species' climate change related threats, visit the PNHP climate change assessment fact sheets page, http://www.naturalheritage.state.pa.us/climate.aspx.
- This species depends on conifers for nesting and roosting habitat. Conifer regeneration, however, is limited through deer browsing, invasive pests, and timber management practices. Reduction of deer populations to control overgrazing, or maintenance of low deer populations at this site, may be necessary to maintain site diversity. Uncommon species of native plants are particularly susceptible to deer herbivory. For a summary of deer management approaches, see the technical report developed by the Northeast Deer Technical Committee (Northeast Deer Technical Committee 2009). Additional resources are also available on the Pennyslvania Game Commission website. Monitor for invasive pests which target conifers at this site, and limit harvesting of mature conifers for timber.
- Conversion of forest to other land uses is a threat. Protect the remaining habitat from conversion to housing, pipelines, and other land uses.
- This species is at risk of collision with automobiles, buildings, power lines and towers, and other objects while foraging. Reduce vehicular traffic through agricultural lands to minimize collisions within the Core Habitat and Supporting Landscape.
- This species is primarily threatened by loss of conifer habitat nesting sites, as the result of management practices, succession, or disease. Consider planting dense stands of native conifers as nesting habitat. Protect remaining best available suitable conifer habitat.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Banks Township

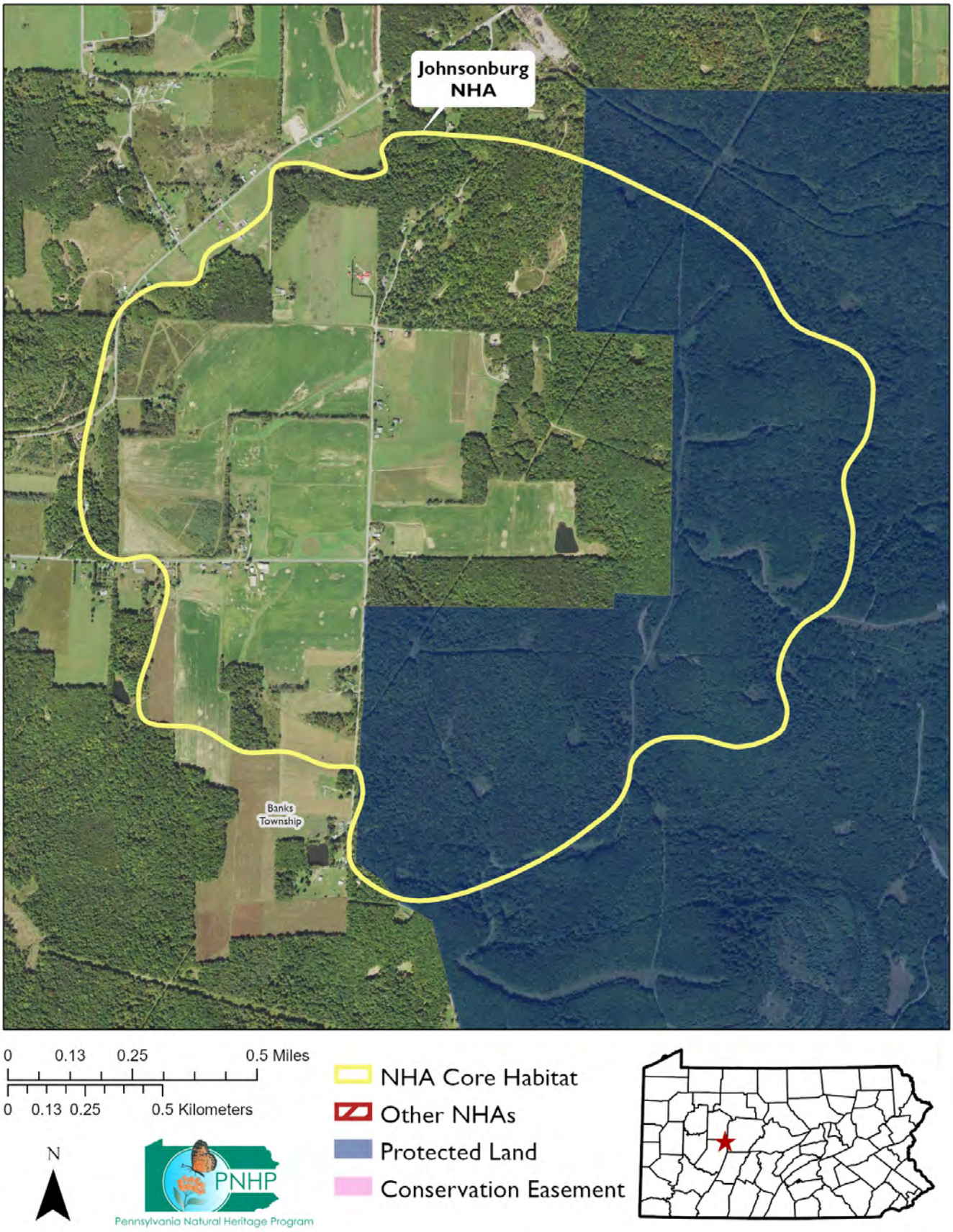
USGS quads: Mc Gees Mills
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: State Game Land 174
Approximate Acreage: 1082 acres

References

Northeast Deer Technical Committee (2009). *An evaluation of deer management options*. URL: https://www.pgc.pa.gov/Wildlife/WildlifeSpecies/White-tailedDeer/Documents/deermgmtoptions.pdf (visited on 01/30/2019).

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Johnsonburg NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Johnsonburg
NHA
Banks
Township
0 0.13 0.25 0.5 Miles
0 0.13 0.25 0.5 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Kilns Run NHA

A site of State Significance

Kilns Run enters West Branch Susquehanna River near the borough of Cherry Tree. This is a more heavily forested section of creek, which provides a vegetative buffer that helps to maintain high water quality. An occurrence of a sensitive species of concern, which is not named at the request of the jurisdictional agency overseeing its protection, was found along this creek. Relying on clean water to maintain healthy invertebrate prey populations, this species also uses bushy vegetation along the creek. Streamside vegetation along the creek is necessary for the maintenance of the water quality and to provide critical habitat for the species of concern found at this site.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site being considered Secure (G5) or Apparently Secure (G4) at the global level, and also sensitive to collection or disturbance. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2004	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

The riparian vegetation is important to this species as habitat and also as a filter for pollutants. Some portions of the riparian area have been thinned for agriculture and residential areas. Removal of the remaining riparian vegetation would destroy habitat and allow runoff to enter directly into the stream. Pesticides or fertilizers used on the agricultural fields and lawns may also degrade water quality.

Preservation of the intact upland forest that supplies clean water to this site is necessary to maintain this population of the species of concern. To accomplish this goal, landowners should be proactively engaged and educated about the value their property provides to clean water in an effort to maintain the entire Kilns Run watershed. Additionally, the wetlands and forested riparian corridor present within the core of this site should be left undisturbed. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- This species has a specific diet of newly molted crayfish and depends on high water quality to maintain stable populations of its food source. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants such as heavy metals, pesticides, and abandoned mine drainage are potential threats to these species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 feet) buffer of native woody vegetation where it exists along the waterways and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Avoid fragmenting the remaining forested areas with additional buildings or infrastructure. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should also be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Clearfield County: Burnside Township; Indiana County: Montgomery Township

USGS quads: Barnesboro

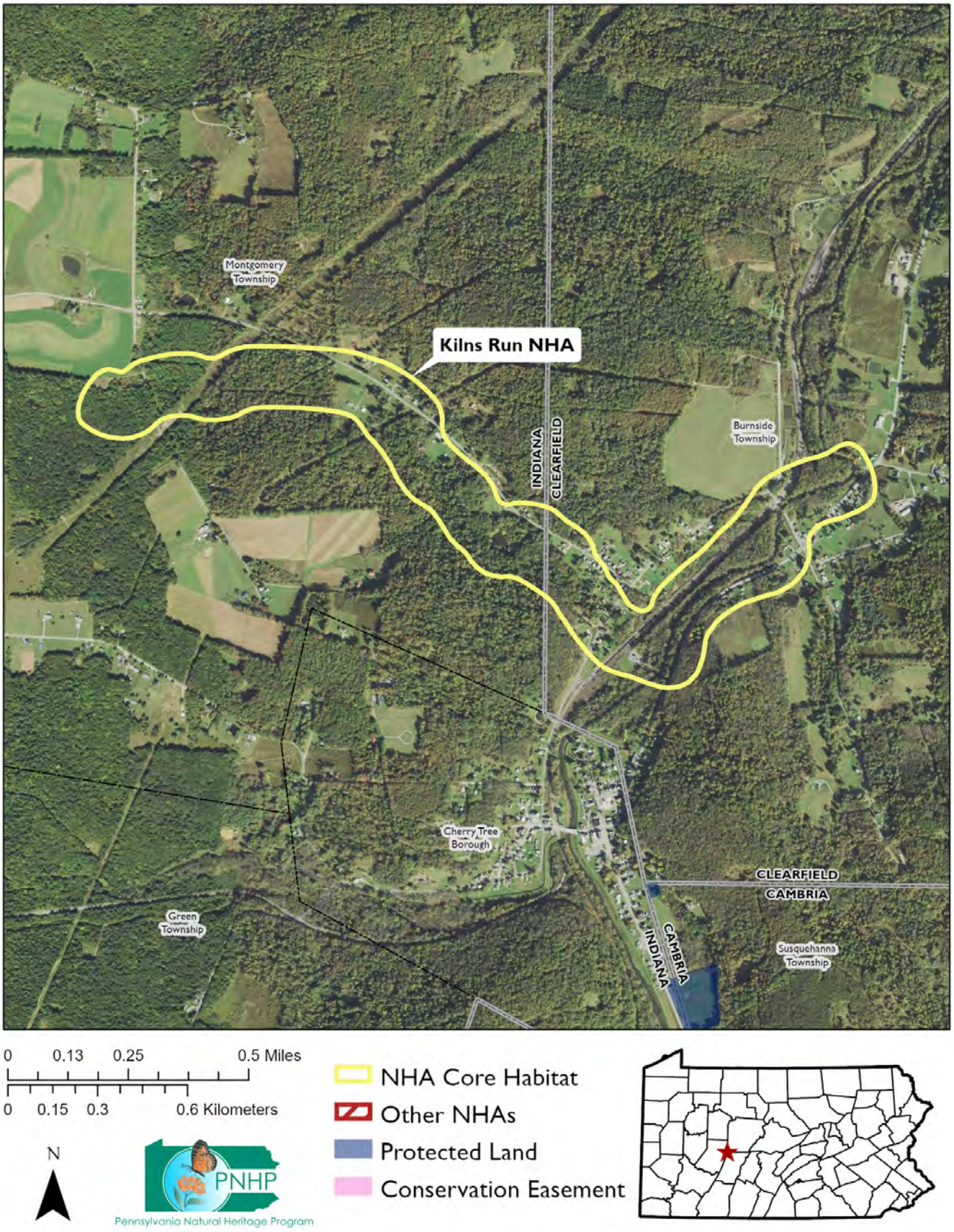
Previous CNHI reference: This site does not overlap a previously published site.

Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 182 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Kilns Run NHA. Created on 15 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Kilns Run NHA
Montgomery Township
Burnside Township
INDIANA
CLEARFIELD
Cherry Tree Borough
Green Township
CLEARFIELD
CAMBRIA
CAMBRIA
INDIANA
Susquehanna Township
0 0.13 0.25 0.5 Miles
0 0.15 0.3 0.6 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Little Mahoning Creek - Lower NHA

A site of Regional Significance

This section of Little Mahoning Creek provides ideal habitat for a wealth of aquatic species because of high water quality and limited historical impacts on the habitat. Among the species of concern found at this site are four freshwater mussel species of concern: **elktoe** (*Alasmidonta marginata*), **rainbow mussel** (*Villosa iris*), **round pigtoe** (*Pleurobema sintoxia*), and **wavy-rayed lampmussel** (*Lampsilis fasciola*). Two dragonfly species of concern breed here: **mustached clubtail** (*Hylogomphus adelphus*) and **rapids clubtail** (*Phanogomphus quadricolor*). Three additional sensitive species of concern also occur here.

Mahoning Creek is a breeding site for the globally vulnerable rapids clubtail. Photo: Don Henise

A wet meadow opening in a floodplain forest at the edge of Old Smicksburg Park is habitat for **Queen-of-the-prairie**(*Filipendula rubra*), a plant that is critically imperiled in Pennsylvania. This wildflower is a member of the rose family, and is most commonly found in fens and other calcium-rich wetlands

This site is of Regional significance. It has been assigned this significance level because of the occurrence of at least one globally vulnerable (G3) species, such as Rapids Clubtail (*Gomphus quadricolor*), within this NHA.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Elktoe (*Alasmidonta marginata*)		G4	S3S4	–	N	2007	E
Wavy-rayed Lampmussel (*Lampsilis fasciola*)		G5	S3S4	–	N	2014	B
Round Pigtoe (*Pleurobema sintoxia*)		G4G5	S3S4	–	PE	2014	E
Rainbow Mussel (*Villosa iris*)		G5	S3	–	PE	2014	E
Queen-of-the-prairie (*Filipendula rubra*)		G4G5	S1S2	TU	TU	2009	E
Mustached Clubtail (*Gomphus adelphus*)		G5	S3S4	–	–	2006	E
Rapids Clubtail (*Gomphus quadricolor*)		G3G4	S2S3	–	–	2007	BC
Sensitive Species of Concern A[3]	S	–	–	–	–	2012	E
Sensitive Species of Concern B[3]	S	–	–	–	–	1991	E
Sensitive Species of Concern C[3]	S	–	–	–	–	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

The plethora of aquatic species of concern at this site is a representation of the historical biodiversity that once populated the streams of western Pennsylvania. This wealth of species has been greatly reduced through mining, improper forestry activities, pollution, and development on the landscape (Ortmann 1909). Today, only a handful of isolated sites within the Commonwealth have similar numbers of aquatic species of concern, making this a key location for actions to maintain water quality. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Sedimentation is a main cause of the freshwater mussel declines throughout North America, because it renders stream bottoms unsuitable as mussel habitat. Sedimentation also threatens one of the sensitive species of concern. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt

loads and shifting, unstable stream bottoms. Siltation and contaminants, such as heavy metals, pesticides, and abandoned mine drainage, have long been recognized as threats to mussels (Ortmann 1909; Williams et al. 1993). Increases in siltation can also indirectly impact freshwater mussel communities by interfering with host fish – mussel interactions. Increased sedimentation can reduce the abundance, diversity, and reproduction of fish, including the host fish that are necessary for protection and dispersal of virtually all freshwater mussels during their larval stage. The increased turbidity associated with suspended sediment loads also interferes with the visual cues used by both adult mussels and host fish in the transfer of the glochidia, or mussel larvae (Box and Mossa 1999). Conserve and expand the forested riparian buffers of this waterway. Streams through forested areas should be considered high priority for conservation. The forested riparian corridor helps to regulate the temperature of the stream and creates streamside conditions that contribute to improved water quality and aquatic habitat. Streams through non-forested areas should be restored with native trees and shrubs appropriate to the habitat. Establish at least a 100 foot buffer of woody vegetation along the creek and its tributaries to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.

- One of the sensitive species of concern depends on clean, cold, well-oxygenated water which maintains its historic seasonal flow regime. Changes to water quantity and quality as a result of land use change which increases sediment input, nutrients, or pollutants, modifies the pH, or increases thermal pollution (e.g. through damming or loss of forested riparian buffers) will negatively affects this species. Existing dams on Little Mahoning Creek are increasing "thermal pollution" by allowing the water to heat up in the sun. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 foot) buffer of native woody vegetation where it exists along the waterways and wetlands and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Avoid damming rivers, or other activities which alter flow regimes.
- An effort should be made to remove all manmade barriers to fish passage within the Little Mahoning Creek watershed. These barriers are increasing thermal pollution and providing habitat for exotic fish species such as common carp (*Cyprinus carpio*) and are a general detriment to the watershed.
- Threats to native mussels include non-native invasive species such as the zebra mussel (*Dreissena polymorpha*) and the Asian clam (*Corbicula fluminea*). Educate the public about the spread of non-native mussels through angler equipment. For more information, see the manual developed by Sea Grant, Pennsylvania (Pennsylvania Sea Grant 2012).
- Aggressive non-native plant species are a threat to the queen-of-the-prairie. Left to spread, these species can crowd out the species of concern, as well as other native plant species. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try to repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. (McPherson 2013)
- Queen-of-the-prairie is only found in wetlands. Conversion to other land uses by draining or filling of wetlands is a threat to the persistence of this species. Avoid developments that encroach on remaining wetland communities. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 foot) buffer of native woody vegetation where it exists along the waterways and wetlands and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Armstrong County: Wayne Township; Indiana County: Smicksburg Borough, South Mahoning Township, West Mahoning Township
USGS quads: Dayton, Marion Center, Plumville
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is associated with the following other NHAs: Mahoning Creek - Indiana County . We recommend consulting the accounts for those sites for additional conservation information.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 710 acres

References

Box, Jayne Brim and Joann Mossa (Mar. 1999). "Sediment, Land Use, and Freshwater Mussels: Prospects and Problems". In: *Journal of the North American Benthological Society* 18.1, pp. 99–117. ISSN: 0887-3593, 1937-237X. DOI: 10.2307/1468011. URL: https://www.journals.uchicago.edu/doi/10.2307/1468011 (visited on 04/16/2018).

McPherson, J. I. (2013). *Conservation Assessment of Calcareous Ecosystems*. Report to Wild Resources Conservation Program Grant #10391. Pittsburgh, Pennsylvania: Pennsylvania Natural Heritage Program, p. 152.

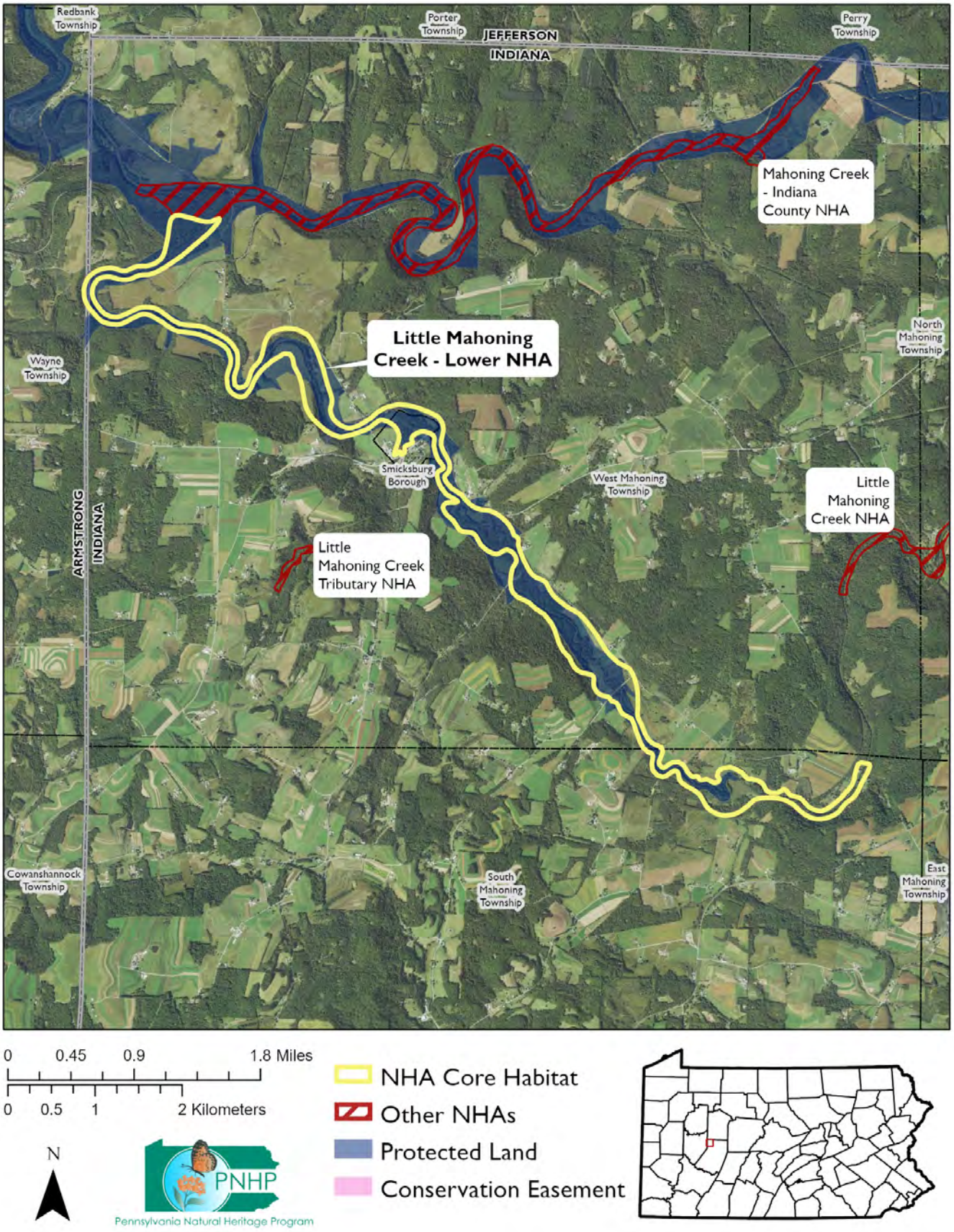
Ortmann, A.E. (1909). "The destruction of the fresh-water fauna in Western Pennsylvania". In: *Proceedings of the American Philosophical Society* 47.191, pp. 90–110.

Pennsylvania Sea Grant (2012). *Pennsylvania invasive mussel monitoring guide*. Erie, PA: Penn State Erie. URL: https://seagrant.psu.edu/resource/aquatic-invasive-species-invasive-species/zebra-and-quagga-mussel-monitoring-guide (visited on 01/30/2019).

Williams, J.D. et al. (1993). "Conservation status of freshwater mussels of the United States of Canada". In: *Fisheries* 18, pp. 6–22.

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Little Mahoning Creek - Lower NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Redbank Township
Porter Township
JEFFERSON
INDIANA
Perry Township
Mahoning Creek - Indiana County NHA
Little Mahoning Creek - Lower NHA
North Mahoning Township
Wayne Township
Smicksburg Borough
West Mahoning Township
Little Mahoning Creek NHA
ARMSTRONG
INDIANA
Little Mahoning Creek Tributary NHA
Cowanshannock Township
South Mahoning Township
East Mahoning Township
0 0.45 0.9 1.8 Miles
0 0.5 1 2 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Little Mahoning Creek NHA

A site of Regional Significance

This site encompasses a 7.5-mile stretch of Mahoning Creek in the northwest corner of Indiana County. The creek flows west to central Armstrong County, where it then flows into the Allegheny River. Mahoning Creek is a considered to be a valuable resource in Pennsylvania, as it is home to a diverse array of freshwater mussels and fish.

This NHA supports several mussel species of concern and other sensitive aquatic species. Some areas of the site are slow-flowing with a mix of pools, runs, and scattered riffles. The stream bottom of areas supporting mussel species of concern is composed of sand and cobble. Other areas of the creek are fast-flowing, with silty pools and a rocky substrate.

Rainbow mussel. Photo: Andrew Strassman.

The riparian corridor along the stream includes both forest and agricultural fields. Forested areas include a silver maple (*Acer saccharinum*) floodplain forest, as well as a sugar maple (*Acer saccharum*) - hemlock (*Tsuga canadensis*) forest. Forested lower slopes with a rich understory and shale outcrops provide habitat for a plant species of concern, mountain bugbane (*Actaea podocarpa*).

This site is of Regional significance. It has been assigned this significance level because of the high concentration of G4, G5, or GNR species at this site.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Wavy-rayed Lampmussel (*Lampsilis fasciola*)		G5	S3S4	–	N	2007	E
Round Pigtoe (*Pleurobema sintoxia*)		G4G5	S3S4	–	PE	2007	E
Sensitive Species of Concern A[3]	S	–	–	–	–	2012	E
Sensitive Species of Concern B[3]	S	–	–	–	–	2011	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Historically, the landscape surrounding this stretch of Mahoning Creek was a mix of forest, agricultural fields, and a railroad. Today, additional disturbances include oil and gas development, a powerline right-of-way, and local roads. The creek's riparian buffer is relatively intact within 50 to 100 feet of the stream, though the invasive Japanese knotweed (*Fallopia japonica*) is present in some areas.

The mussels and other aquatic species found at this site rely upon high water quality. Depending on agricultural practices, the fields upslope from the NHA have the potential to contribute to sedimentation and degraded water quality. Habitat is also threatened by potential development or logging of forested areas along the creek. This would reduce the width of the forested buffer that regulates stream conditions. Additionally, disturbance of forested areas could threaten habitat for mountain bugbane, which is found in rich, hardwood forests. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Degradation of water quality can have a negative impact on the habitat supporting the aquatic species of concern found within this segment of Mahoning Creek. The stormwater runoff from roadways, suburban development, and agriculture

should be considered a potential source of significant contamination for the stream habitat. Runoff from these sources has significantly higher levels of sediment, nutrients, pesticides, herbicides, and other pollutants than runoff filtered through a natural habitat. Maintaining a high-quality aquatic habitat is important to the many species of concern found at this site. Improve water quality and maintain the water quantity by protecting and enhancing existing aquatic habitats by monitoring water quality and enforcing protections. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area, including creating buffers to protect wetlands and waterbodies from upland disturbances.

- The sensitive species of concern are particularly dependent upon clean, cold, well-oxygenated water that maintains its historic seasonal flow regime. Changes to water quantity and quality as a result of land use change which increases sediment input, nutrients, or pollutants, modifies the pH, or increases thermal pollution (e.g. through damming or loss of forested riparian buffers) will negatively affects this species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100-meter (328-foot) buffer of native woody vegetation where it exists along the waterways and wetlands and establish at least a 30-meter (100-foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Avoid damming rivers, or other activities which alter flow regimes.
- Sedimentation is a main cause of the freshwater mussel declines throughout North America, because it renders stream bottoms unsuitable as mussel habitat. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants, such as heavy metals, pesticides, and abandoned mine drainage, have long been recognized as threats to mussels (Ortmann 1909; Williams et al. 1993). Increases in siltation can also indirectly impact freshwater mussel communities by interfering with host fish – mussel interactions. Increased sedimentation can reduce the abundance, diversity, and reproduction of fish, including the host fish that are necessary for protection and dispersal of virtually all freshwater mussels during their larval stage. The increased turbidity associated with suspended sediment loads also interferes with the visual cues used by both adult mussels and host fish in the transfer of the glochidia, or mussel larvae (Box and Mossa 1999). Conserve and expand the forested riparian buffers of this waterway. Streams through forested areas should be considered high priority for conservation. The forested riparian corridor helps to regulate the temperature of the stream and creates streamside conditions that contribute to improved water quality and aquatic habitat. Streams through non-forested areas should be restored with native trees and shrubs appropriate to the habitat. Establish at least a 100-foot buffer of woody vegetation along the creek and its tributaries to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.
- Threats to native mussels include non-native invasive species such as the zebra mussel (*Dreissena polymorpha*) and the Asian clam (*Corbicula fluminea*). Educate the public about the spread of non-native mussels through angler equipment. For more information, see the manual developed by Sea Grant, Pennsylvania (Pennsylvania Sea Grant 2012).
- Mountain bugbane depends on relatively undisturbed, rich hardwood forests. Development and logging activities are the primary threats to this species. Protect remaining habitat from fragmentation and conversion to housing, pipelines, and other land uses. For more information about the status of forested land in Pennsylvania, see Albright et al. (2017).

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Grant Township, North Mahoning Township, West Mahoning Township, Canoe Township, East Mahoning Township
USGS quads: Marion Center, Rochester Mills
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 801 acres

References

Albright, Thomas A. et al. (2017). *Pennsylvania forests 2014*. NRS-RB-111. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. DOI: 10.2737/NRS-RB-111. URL: https://www.nrs.fs.fed.us/pubs/54420 (visited on 01/30/2019).

Box, Jayne Brim and Joann Mossa (Mar. 1999). "Sediment, Land Use, and Freshwater Mussels: Prospects and Problems". In: *Journal of the North American Benthological Society* 18.1, pp. 99–117. ISSN: 0887-3593, 1937-237X. DOI: 10.2307/1468011. URL: https://www.journals.uchicago.edu/doi/10.2307/1468011 (visited on 04/16/2018).

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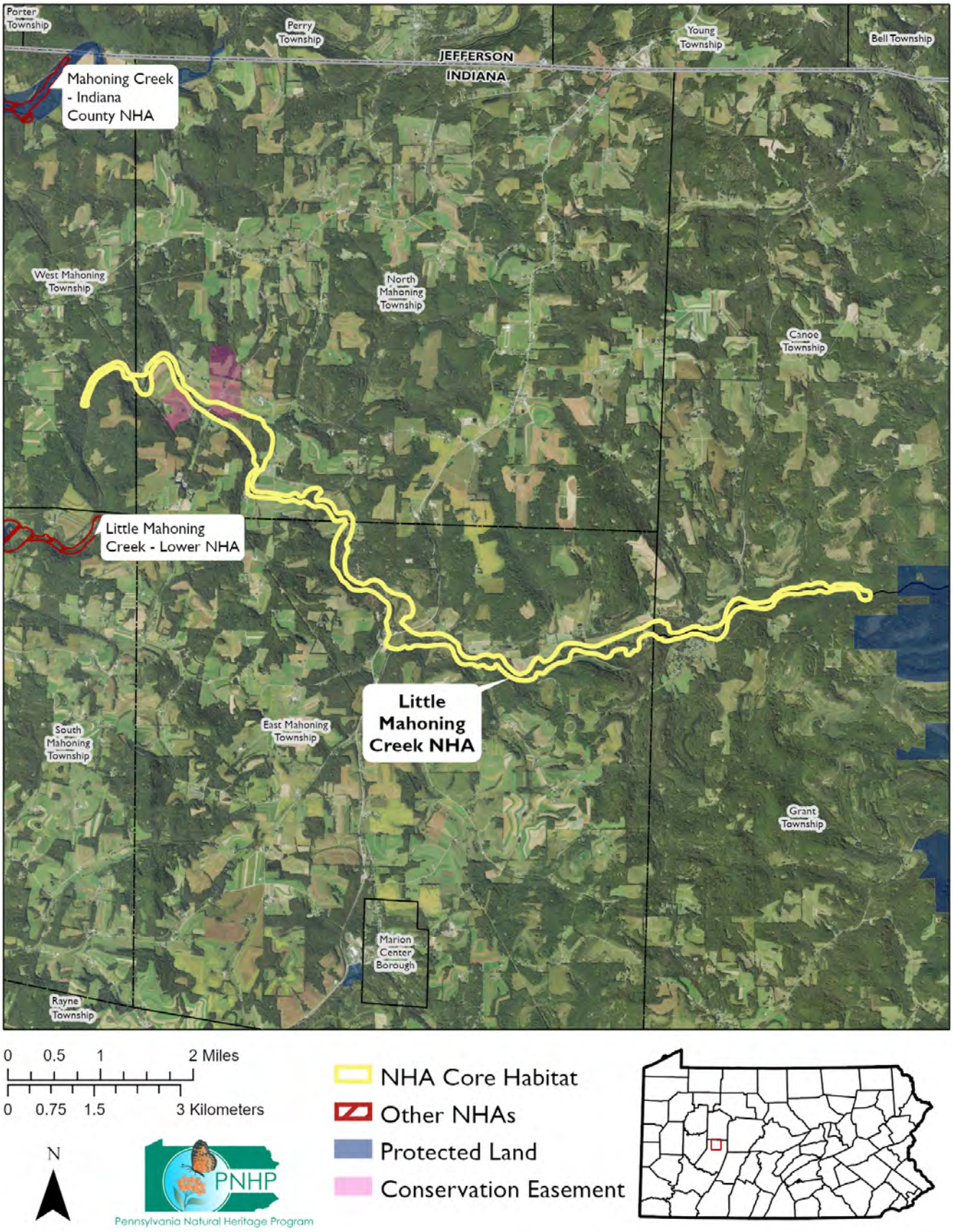
Pennsylvania Sea Grant (2012). *Pennsylvania invasive mussel monitoring guide*. Erie, PA: Penn State Erie. URL: https://seagrant.psu.edu/resource/aquatic-invasive-species-invasive-species/zebra-and-quagga-mussel-monitoring-guide (visited on 01/30/2019).

Williams, J.D. et al. (1993). "Conservation status of freshwater mussels of the United States of Canada". In: *Fisheries* 18, pp. 6–22.

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Little Mahoning Creek NHA. Created on 15 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Porter Township
Perry Township
JEFFERSON
INDIANA
Young Township
Bell Township
Mahoning Creek - Indiana County NHA
West Mahoning Township
North Mahoning Township
Canoe Township
Little Mahoning Creek - Lower NHA
Little Mahoning Creek NHA
South Mahoning Township
East Mahoning Township
Grant Township
Marion Center Borough
Rayne Township
0 0.5 1 2 Miles
0 0.75 1.5 3 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Little Mahoning Creek Tributary NHA

A site of Regional Significance

An unnamed headwater stream that is a tributary of Little Mahoning Creek is habitat for a sensitive species of concern. The stream is moderate to high gradient, and flows through a valley where the riparian zone is forested.

This site is of Regional significance. It has been assigned this significance level because of the high concentration of G4, G5, or GNR species at this site.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2009	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Protecting the water quality in this stream is key to protecting the species of concern. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- The species of concern depends on clean, cold, well-oxygenated water which maintains its historic seasonal flow regime. Changes to water quantity and quality as a result of land use change which increases sediment input, nutrients, or pollutants, modifies the pH, or increases thermal pollution (e.g. through damming or loss of forested riparian buffers) will negatively affects this species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 foot) buffer of native woody vegetation where it exists along the waterways and wetlands and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Avoid damming rivers, or other activities which alter flow regimes.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

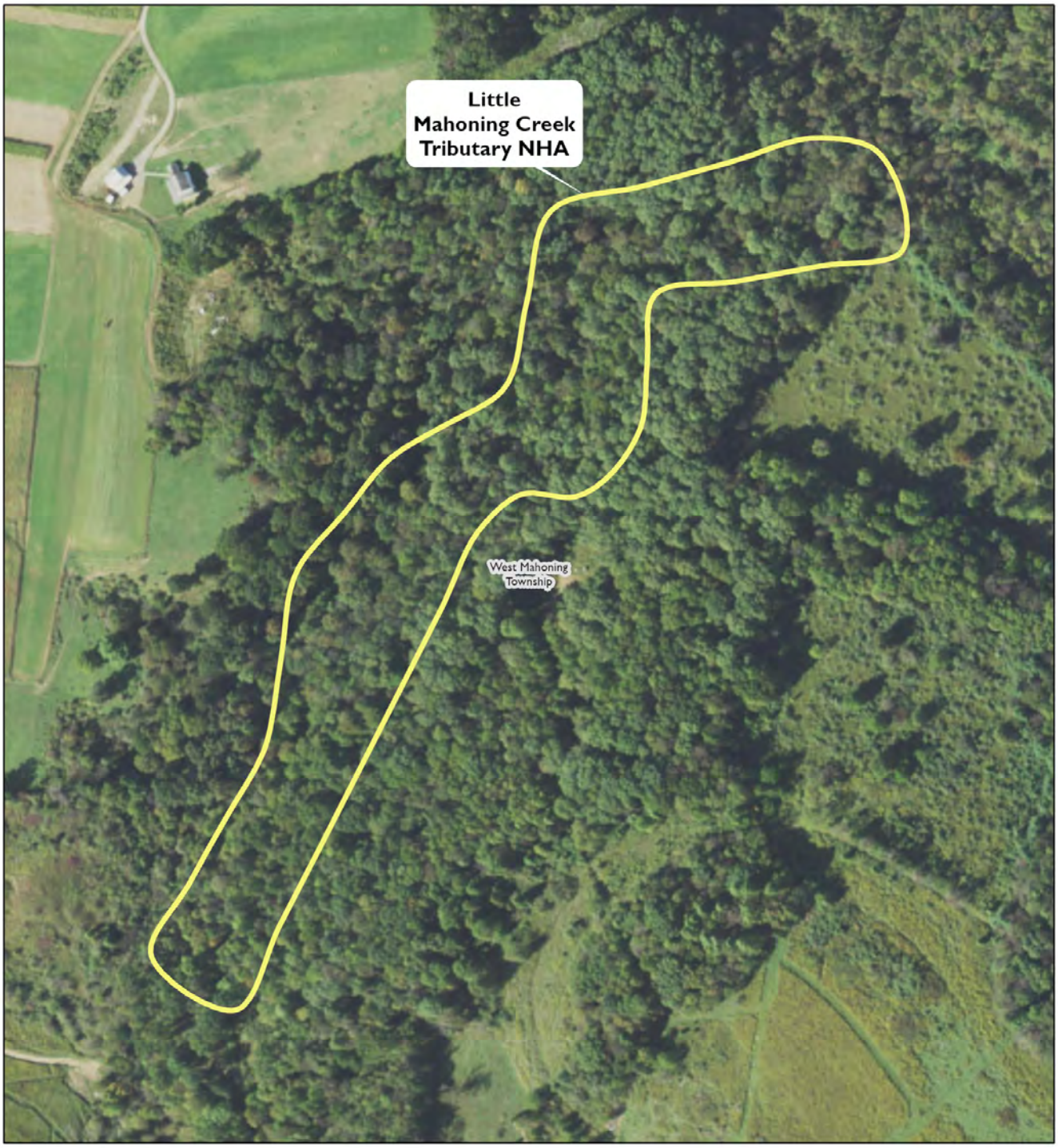
Municipalities: Indiana County: West Mahoning Township

USGS quads: Plumville
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 12 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Little Mahoning Creek Tributary NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx



0 0.03 0.05 0.1 Miles

0 0.03 0.06 0.11 Kilometers

N

PNHP

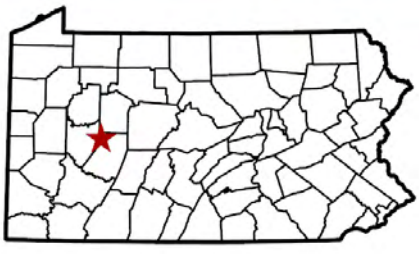
Pennsylvania Natural Heritage Program

NHA Core Habitat

Other NHAs

Protected Land

Conservation Easement



Little Yellow Creek NHA

A site of Global Significance

This site is centered on the lower reaches of Little Yellow Creek and the surrounding forest. The creek here supports a dragonfly species of concern, the **sable clubtail** (*Stenogomphurus rogersi*). The **sable clubtail** is a dragonfly species that prefers forested, clear-water streams of a moderate size with a decent current and a rocky bottom. The larvae of this species are most often found below a log jam or other significant pile of in-stream course woody debris. Adults are active from mid-April through July and can be seen occasionally patrolling the waterway, though they often forage well into the canopy of the forest.

A mating pair of West Virginia whites. Photo: Pete Woods, PNHP

Underlying limestone enriches the soils at this site, resulting in a rich mesic forest dominated by black cherry (*Prunus serotina*), American beech (*Fagus grandifolia*), and eastern hemlock (*Tsuga canadensis*). The herbaceous layer includes species such as yellow trout lily (*Erythronium americanum*), rue anemone (*Thalictrum thalictroides*), blue cohosh (*Caulophyllum thalictroides*), wakerobin (*Trillium erectum*), skunk cabbage (*Symplocarpus foetidus*), and wood ferns (*Dryopteris* sp.). The **West Virginia White** (*Pieris virginiensis*) is a rare butterfly that lives in this forest, and whose caterpillars use toothworts (*Cardamine diphylla* and *C. concatenata*) as host plants. This site also supports the **delicate vertigo** (*Vertigo bollesiana*), a snail species of concern found in rich mesic forests. Openings and edges at this site support the **Baltimore checkerspot** (*Euphydryas phaeton*), a butterfly species of concern. This site also provides habitat for two additional sensitive species of concern.

This site is of Global significance. It has been assigned this significance level because of the presence of a globally rare species, such as West Virginia White (*Pieris virginiensis*), which occurs within the NHA. Sites designated as Globally Significant are of highest conservation concern within the Commonwealth.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Delicate Vertigo (*Vertigo bollesiana*)		G4G5	S3	–	–	2007	E
Sable Clubtail (*Gomphus rogersi*)		G4	S3	–	–	2007	BC
Baltimore Checkerspot (*Euphydryas phaeton*)		G4	S3	–	–	2010	E
West Virginia White (*Pieris virginiensis*)		G2G3	S2	–	–	2007	E
Sensitive Species of Concern A[3]	S	–	–	–	–	2010	BC
Sensitive Species of Concern B[3]	S	–	–	–	–	2009	B

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

The species of concern at this site can best be maintained by avoiding disturbance or degradation of the rich mesic forest, and by protecting water quality in Little Yellow Creek. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Over-browsing by white-tailed deer is a serious threat to the overall understory plant diversity. An overabundance of

deer can create the effect of park-like forests in which the understory and vertical stratification is greatly reduced. The loss of understory species eliminates habitat for some nesting songbirds as well as increasing competition between deer and other wildlife due to reduced food sources. Reduction of deer populations to control overgrazing, or maintenance of low deer populations at this site, may be necessary to maintain site diversity. Uncommon species of native plants are particularly susceptible to deer herbivory. Furthermore, a reduction in abundance or diversity of wildflowers can leave butterflies without a source of food. West Virginia whites rely on several successive waves of spring flowers as a nectar source for adults, and they rely on toothworts (*Cardamine* spp.) as host plants. Baltimore checkerspots are vulnerable to deer browse because their caterpillars depend on turtlehead (*Chelone glabra*), a plant that is favored by deer. Reduction of deer populations to control overgrazing, or maintenance of low deer populations at this site (Northeast Deer Technical Committee 2009), will benefit butterflies by increasing flowering plant diversity at the site.

- Aggressive non-native plant species are a particular threat to species in calcareous habitats. Left to spread, these species can crowd out the species of concern, as well as other native plant species, and the animal species that depend on them. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try to repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. Continual invasive species monitoring and control will likely be necessary (McPherson 2013). Garlic mustard (*Alliaria petiolata*) and vinca (*Vinca minor*) are well-established at this site.
- The spread of the invasive garlic mustard (*Alliaria petiolata*), in particular, is a major threat to the West Virginia white butterfly (Davis and Cipollini 2014). This invasive plant is in the same family as toothworts (the mustard family), and the chemical signatures of the plants are similar enough that female butterflies will readily lay their eggs on garlic mustard. The caterpillars, however, cannot survive on garlic mustard, and these butterflies have disappeared from areas where garlic mustard is dominant. Garlic mustard and other invasive species should be controlled. For more information on controlling garlic mustard, see the fact sheet developed by the PA DCNR (Conservation and Resources 2019).
- Fragmentation of the forest is a serious threat to the West Virginia white, because these butterflies do not cross wide roads or other non-forested areas. The result is that populations are becoming genetically isolated, and if a population is extirpated the chances are low that remaining populations will be able to recolonize the habitat. The sensitive species of concern are also vulnerable to fragmentation of the forest canopy, which can have a negative impact on the habitat by creating open conditions favorable for invasive plant colonization, and drying the habitat by allowing sunlight and wind to desiccate the soil. Avoid logging in this area except as it relates to invasive species removal. The forest cover should be allowed to achieve and maintain old-growth characteristics. Fragmentation of the remaining forest should be avoided. New development such as housing, roads, and powerlines should be concentrated in areas that have already been disturbed.
- Conversion of forest to other land uses is a threat to all of the species of concern at this site. Protect the remaining habitat from conversion to housing, pipelines, and other land uses.
- Damselflies and dragonflies rely on good water quality, although the tolerances of individual species to different types of pollution are not well-understood. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants such as heavy metals, pesticides, and abandoned mine drainage are potential threats to these species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 feet) buffer of native woody vegetation where it exists along the waterways and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Brush Valley Township, Buffington Township

USGS quads: Brush Valley, Strongstown

Previous CNHI reference: This site does not overlap a previously published site.

Associated NHAs: This site is associated with the following other NHAs: Yellow Creek State Park . We recommend consulting the accounts for those sites for additional conservation information.

Overlapping Protected Lands: State Game Land 79, Yellow Creek State Park

Approximate Acreage: 1252 acres

References

Conservation, Pennsylvania Department of and Natural Resources (2019). *Invasive plants in Pennsylvania: Garlic Mustard*. URL: http://www.docs.dcnr.pa.gov/cs/groups/public/documents/document/dcnr_010274.pdf (visited on 01/31/2019).

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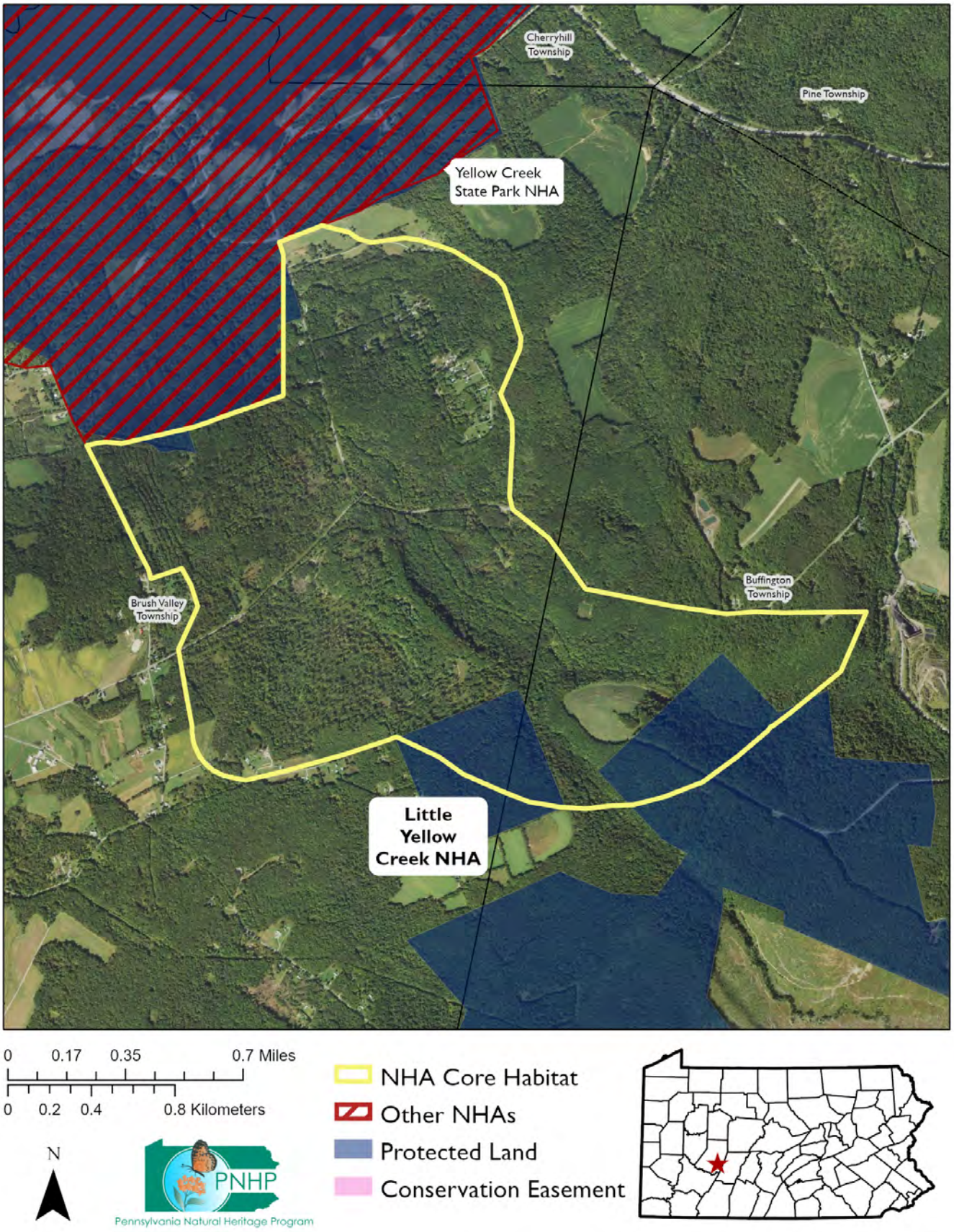
This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Little Yellow Creek NHA. Created on 14 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Cherryhill Township
Pine Township
Yellow Creek State Park NHA
Brush Valley Township
Buffington Township
Little Yellow Creek NHA
0 0.17 0.35 0.7 Miles
0 0.2 0.4 0.8 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Little Yellow Creek at Strongstown NHA

A site of Global Significance

This stretch of Little Yellow Creek supports the **least brook lamprey** (*Lampetra aepyptera*), a fish species of concern. This harmless, filter-feeding fish should not be confused with its parasitic cousin, the sea lamprey (*Petromyzon marinus*).

The forests along this part of Little Yellow Creek are dominated by black cherry (*Prunus serotina*), eastern hemlock (*Tsuga canadensis*), black birch (*Betula nigra*), sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), and red oak (*Quercus rubra*). These forests support **silver-haired bat** (*Lasionycteris noctivagans*) and a sensitive species of concern.

The least brook lamprey spends its life mostly buried in soft sediments, filtering food from the stream water. Photo: FredlyFish4, Creative Commons

This site is of Global significance. It has been assigned this significance level because of the presence of a sensitive species of concern that is either of a G1 or G2 rank. Sites designated as Globally Significant are of highest conservation concern within the Commonwealth.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Silver-haired Bat (*Lasionycteris noctivagans*)		G3G4	S1	–	CR	2007	E
Least Brook Lamprey (*Lampetra aepyptera*)		G5	S4	PC	CR	2003	E
Sensitive Species of Concern A[3]	S	–	–	–	–	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Improving the water quality of Little Yellow Creek and protecting the riparian forests will help the species of concern persist at this site. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Silver-haired bat relies on intact, interior forest habitat with many large, old trees and standing snags for foraging and roosting. Fragmentation as a result of human developments, or logging, are threats to this species. Avoid the removal of large native trees with naturally exfoliating bark such as shagbark hickory, and allow snags or dying trees to persist upon the landscape as these provide suitable summer roost areas.
- The sensitive species' foraging may be disrupted by artificial lights. Reduce light pollution, particularly during mid-spring through mid-fall. Where outdoor lights are necessary, angle lights downward or minimize light directed into the sky through other measures.
- Abandoned Mine Drainage (AMD) is a threat to the least brook lamprey. This section of the creek has been classified as Impaired due to the heavy metals leached from old coal mines. Pinpoint the source of the mine drainage and install a remediation system to clean the water before it flows into the creek .
- Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads, reducing habitat quality for the brook lamprey. Conserve and expand the forested riparian buffers of this waterway. Streams through forested areas should be considered high priority for conservation. The forested riparian corridor helps to regulate the temperature of the stream and creates streamside conditions that contribute to improved water quality and aquatic habitat. Streams through non-forested areas should be restored with native trees and shrubs appropriate to the habitat. Establish at least a 100 foot buffer of woody vegetation along the creek and its tributaries to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

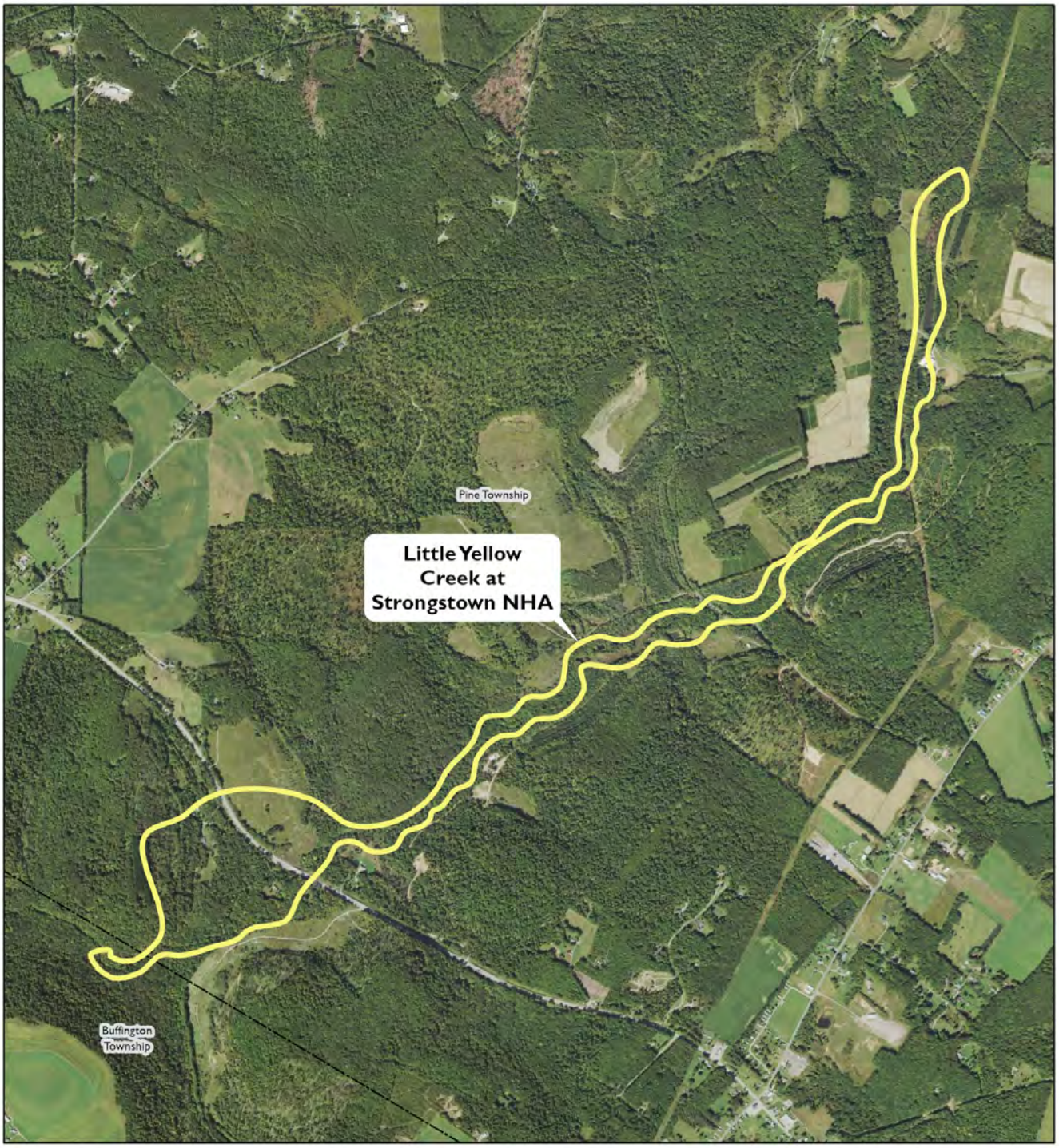
Municipalities: Indiana County: Pine Township, Buffington Township

USGS quads: Strongstown
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 211 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Little Yellow Creek at Strongstown NHA. Created on 15 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Pine Township
Little Yellow Creek at Strongstown NHA
Buffington Township
0 0.17 0.35 0.7 Miles
0 0.2 0.4 0.8 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Mahoning Creek - Indiana County NHA

A site of Regional Significance

This site encompasses a 7.5-mile stretch of Mahoning Creek in the northwest corner of Indiana County. The creek flows west to central Armstrong County, where it flows into the Allegheny River. Mahoning Creek is a considered to be a valuable resource in Pennsylvania, as it is home to a diverse array of freshwater mussels and fish.

wavy-rayed lampmussel. Photo: Mary Walsh, PNHP

This NHA supports several mussel species of concern and other sensitive aquatic species. Some areas of the site are slow-flowing with a mix of pools, runs, and scattered riffles. The stream bottom of areas supporting mussel species of concern is composed of sand and cobble. Other areas of the creek are fast-flowing with silty pools and a rocky substrate.

The riparian corridor along the stream includes both forest and agricultural fields. Forested areas include a silver maple (*Acer saccharinum*) floodplain forest, as well as a sugar maple (*Acer saccharum*) - hemlock (*Tsuga canadensis*) forest. Forested lower slopes with a rich understory and shale outcrops provide habitat for a plant species of concern, **mountain bugbane** (*Actaea podocarpa*).

This site is of Regional significance. It has been assigned this significance level because of the high concentration of G4, G5, or GNR species at this site.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status[1]	PABS Status[1]	Last Observed	Quality[2]
Elktoe (*Alasmidonta marginata*)		G4	S3S4	–	N	2007	E
Wavy-rayed Lampmussel (*Lampsilis fasciola*)		G5	S3S4	–	N	2014	B
Round Pigtoe (*Pleurobema sintoxia*)		G4G5	S3S4	–	PE	2014	E
Rayed Bean Mussel (*Villosa fabalis*)		G5	S4	–	N	2007	E
Rainbow Mussel (*Villosa iris*)		G5	S3	–	PE	2014	E
Mountain Bugbane (*Actaea podocarpa*)		G4	S3	PT	PR	2008	AB
Sensitive Species of Concern A[3]	S	–	–	–	–	2005	E
Sensitive Species of Concern B[3]	S	–	–	–	–	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Historically, the landscape surrounding this stretch of Mahoning Creek was a mix of forest, agricultural fields, and a railroad. Today, additional disturbances include oil and gas development, powerline right-of-way, and local roads. The creek's riparian buffer is relatively intact within 50 to 100 feet of the stream, though the invasive Japanese knotweed (*Fallopia japonica*) is present in some areas.

The mussels and other aquatic species found at this site rely upon high water quality. Depending on agricultural practices, the fields upslope from the NHA have the potential to contribute to sedimentation and degraded water quality. Habitat is also threatened by potential development or logging of forested areas along the creek. This would reduce the width of the

forested buffer that regulates stream conditions. Additionally, disturbance of forested areas could threaten habitat for mountain bugbane, which is found in rich, hardwood forests. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Degradation of water quality can have a negative impact on the habitat supporting the aquatic species of concern found within this segment of Mahoning Creek. The stormwater runoff from roadways, suburban development, and agriculture should be considered a potential source of significant contamination for the stream habitat. Runoff from these sources has significantly higher levels of sediment, nutrients, pesticides, herbicides, and other pollutants than runoff filtered through a natural habitat. Maintaining a high-quality aquatic habitat is important to the many species of concern found at this site. Improve water quality and maintain the water quantity by protecting and enhancing existing aquatic habitats by monitoring water quality and enforcing protections. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area, including creating buffers to protect wetlands and waterbodies from upland disturbances.
- The sensitive species of concern are particularly dependent upon clean, cold, well-oxygenated water that maintains its historic seasonal flow regime. Changes to water quantity and quality as a result of land use change which increases sediment input, nutrients, or pollutants, modifies the pH, or increases thermal pollution (e.g. through damming or loss of forested riparian buffers) will negatively affects this species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100-meter (328-foot) buffer of native woody vegetation where it exists along the waterways and wetlands and establish at least a 30-meter (100-foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Avoid damming rivers, or other activities which alter flow regimes.
- Sedimentation is a main cause of the freshwater mussel declines throughout North America, because it renders stream bottoms unsuitable as mussel habitat. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants, such as heavy metals, pesticides, and abandoned mine drainage, have long been recognized as threats to mussels (Ortmann 1909; Williams et al. 1993). Increases in siltation can also indirectly impact freshwater mussel communities by interfering with host fish – mussel interactions. Increased sedimentation can reduce the abundance, diversity, and reproduction of fish, including the host fish that are necessary for protection and dispersal of virtually all freshwater mussels during their larval stage. The increased turbidity associated with suspended sediment loads also interferes with the visual cues used by both adult mussels and host fish in the transfer of the glochidia, or mussel larvae (Box and Mossa 1999). Conserve and expand the forested riparian buffers of this waterway. Streams through forested areas should be considered high priority for conservation. The forested riparian corridor helps to regulate the temperature of the stream and creates streamside conditions that contribute to improved water quality and aquatic habitat. Streams through non-forested areas should be restored with native trees and shrubs appropriate to the habitat. Establish at least a 100-foot buffer of woody vegetation along the creek and its tributaries to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.
- Threats to native mussels include non-native invasive species such as the zebra mussel (*Dreissena polymorpha*) and the Asian clam (*Corbicula fluminea*). Educate the public about the spread of non-native mussels through angler equipment. For more information, see the manual developed by Sea Grant, Pennsylvania (Pennsylvania Sea Grant 2012).
- Mountain bugbane depends on relatively undisturbed, rich hardwood forests. Development and logging activities are the primary threats to this species. Protect remaining habitat from fragmentation and conversion to housing, pipelines, and other land uses.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: West Mahoning Township

USGS quads: Dayton, Valier

Previous CNHI reference: This site does not overlap a previously published site.

Associated NHAs: This site is associated with the following other NHAs: Little Mahoning Creek - Lower . We recommend consulting the accounts for those sites for additional conservation information.

Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.

Approximate Acreage: 408 acres

References

Box, Jayne Brim and Joann Mossa (Mar. 1999). "Sediment, Land Use, and Freshwater Mussels: Prospects and Problems". In: *Journal of the North American Benthological Society* 18.1, pp. 99–117. ISSN: 0887-3593, 1937-237X. DOI: 10.2307/1468011. URL: https://www.journals.uchicago.edu/doi/10.2307/1468011 (visited on 04/16/2018).

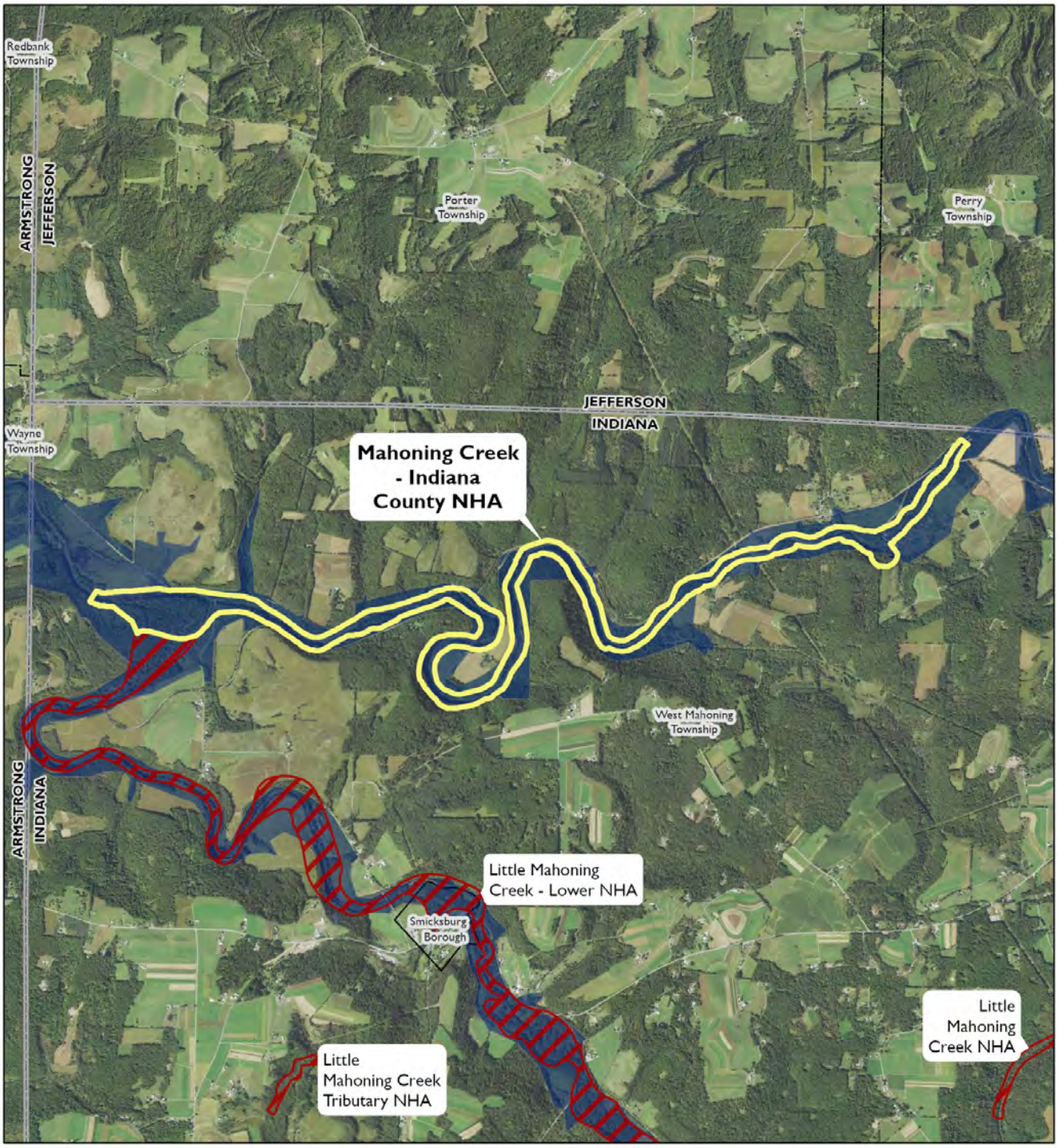
Ortmann, A.E. (1909). "The destruction of the fresh-water fauna in Western Pennsylvania". In: *Proceedings of the American Philosophical Society* 47.191, pp. 90–110.

Pennsylvania Sea Grant (2012). *Pennsylvania invasive mussel monitoring guide*. Erie, PA: Penn State Erie. URL: https://seagrant.psu.edu/resource/aquatic-invasive-species-invasive-species/zebra-and-quagga-mussel-monitoring-guide (visited on 01/30/2019).

Williams, J.D. et al. (1993). "Conservation status of freshwater mussels of the United States of Canada". In: *Fisheries* 18, pp. 6–22.

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Mahoning Creek - Indiana County NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx



0 0.38 0.75 1.5 Miles

0 0.45 0.9 1.8 Kilometers

N

PNHP

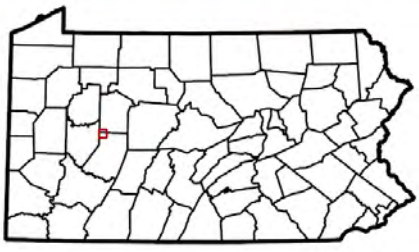
Pennsylvania Natural Heritage Program

NHA Core Habitat

Other NHAs

Protected Land

Conservation Easement



Montgomery Road NHA

A site of State Significance

Montgomery Road NHA is predominately forested, with clearings and access roads for gas wells. Montgomery Road borders the western side of the site and an unnamed intermittent stream flows through the site from west to east. Outside of the NHA, the stream eventually turns north and flows into Gobblers Run. Wetlands on slopes above the stream provide habitat for **netted chainfern** (*Woodwardia areolata*). This rare species has been found at several other natural gas sites, and it is possible that spores are being moved around by gas crews, throughout Western PA.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

Netted chainfern, a rare fern species, grows at this site despite much disturbance as a result of natural gas drilling. Photo: Mary Keim, Creative Commons

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Netted Chainfern (*Woodwardia areolata*)	G5	S3	N	PR	2018	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

The forest community at this site has been disturbed and fragmented by gas well pads and associated access roads. The general area has also been extensively strip mined and deep mined. This population of netted chainfern is vulnerable to expansion of natural gas and mining operations as well as the introduction of aggressive non-native species. Existing invasive species known to occur at this site include Japanese knotweed (*Fallopia japonica*) and Japanese stiltgrass (*Microstegium vimineum*). As netted chainfern depends upon wetland habitat, it is also vulnerable to changes in hydrology, erosion, and stormwater runoff. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Changes in the current hydrology could significantly alter the habitat for netted chainfern, by making conditions either too wet or too dry for it to persist at this site. Limit disturbances to watershed hydrology by avoiding large infrastructure projects which alter flow regimes, and maintaining forested riparian buffers to slow stormwater runoff.
- Conversion to other land uses by draining or filling of wetlands and aquatic habitats may be a threat to the persistence of this species. Avoid developments that encroach on remaining wetland communities and aquatic areas. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100-meter (328-foot) buffer of native woody vegetation where it exists along the waterways and wetlands and establish at least a 30-meter (100-foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.
- Aggressive non-native plant species are a potential threat. Left to spread, these species can crowd out the species of concern, as well as other native plant species. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try to repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species

present. Continual invasive species monitoring and control will likely be necessary.

- Populations of this species in Pennsylvania tend to be small. Smaller populations are more at risk of being negatively impacted or extirpated by random events, such as severe storms, or by human actions such as trampling or ill-timed management activities, or by habitat-degrading factors like invasive species encroachment. Actions to support and protect small populations may require more proactive conservation strategies, such as seed banking or reintroduction of plants to new locations, or following disturbances. See the Center for Plant Conservation's 2018 guide for more details about these types of proactive conservation strategies (**center_for_plant_conservation_cpc_2019**).

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

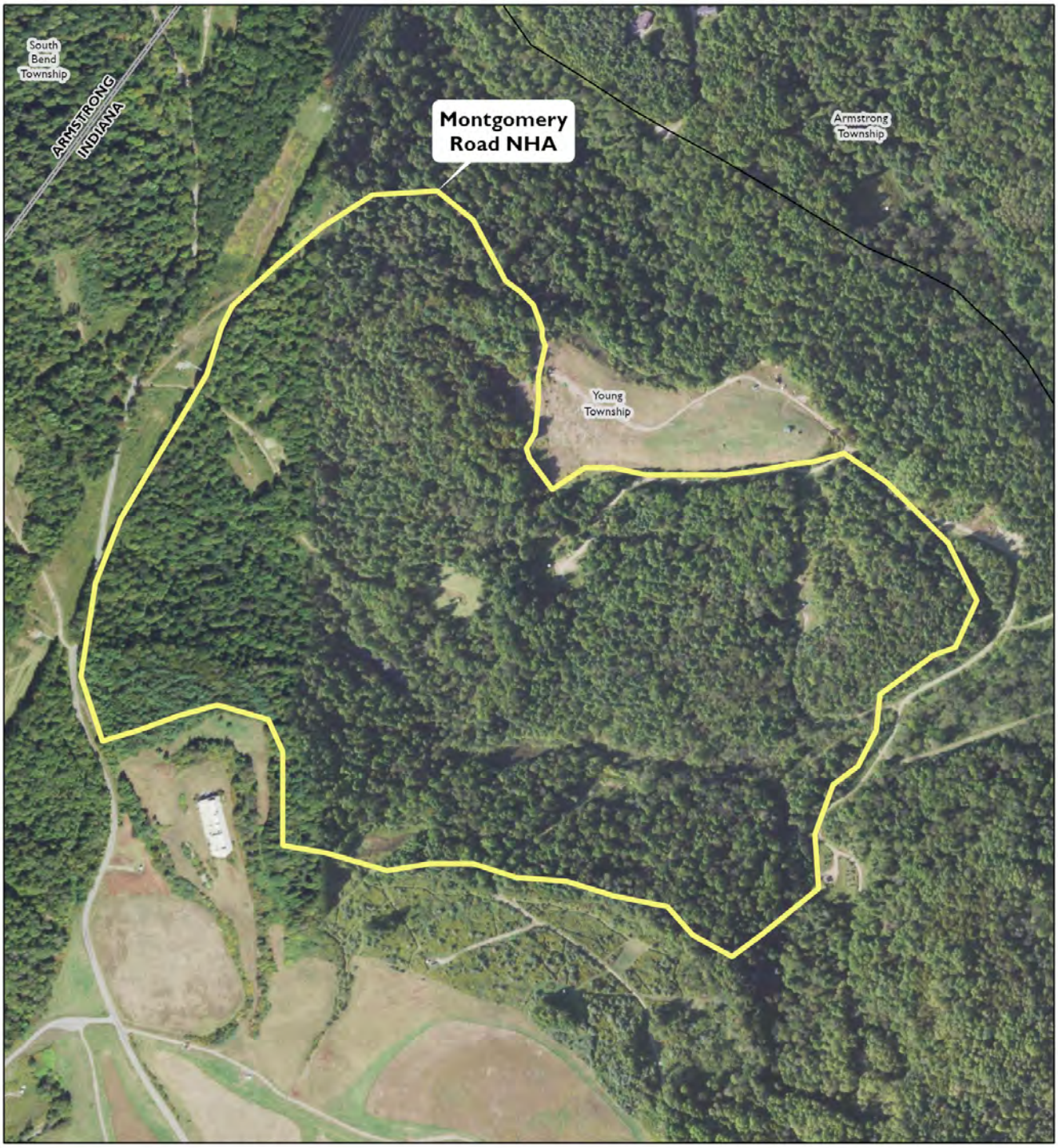
Municipalities: Indiana County: Young Township

USGS quads: Mc Intyre
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 136 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Montgomery Road NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


South Bend Township
ARMSTRONG
INDIANA
Montgomery Road NHA
Armstrong Township
Young Township
0 0.05 0.1 0.2 Miles
0 0.05 0.1 0.2 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Mountain View Road NHA

A site of Global Significance

This small patch of primarily wooded habitat is approximately 30 acres in size, with a portion of the northern end planted with conifers in an early successional field. Surrounding areas consist of agricultural fields and low density residential housing with scattered woodlots. The wooded habitat supports a population of a sensitive species of concern.

This site is of Global significance. It has been assigned this significance level because of the presence of a sensitive species of concern that is either of a G1 or G2 rank. Sites designated as Globally Significant are of highest conservation concern within the Commonwealth.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2014	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Further disturbance to the wooded areas may reduce the available habitat. Allow regeneration of native species where possible. Agricultural and residential land use near the wooded habitat may impact insect populations with pesticide use, and thus the use of pesticides should be limited. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- This species relies on intact, interior forest habitat with many large, old trees and standing snags for foraging and roosting. Fragmentation as a result of human developments, or logging, are threats to this species. Avoid the removal of large native trees with naturally exfoliating bark such as shagbark hickory, and allow snags or dying trees to persist upon the landscape as these provide suitable summer roost areas.
- This species' foraging may be disrupted by artificial lights. Reduce light pollution, particularly during mid-spring through mid-fall. Where outdoor lights are necessary, angle lights downward or minimize light directed into the sky through other measures.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

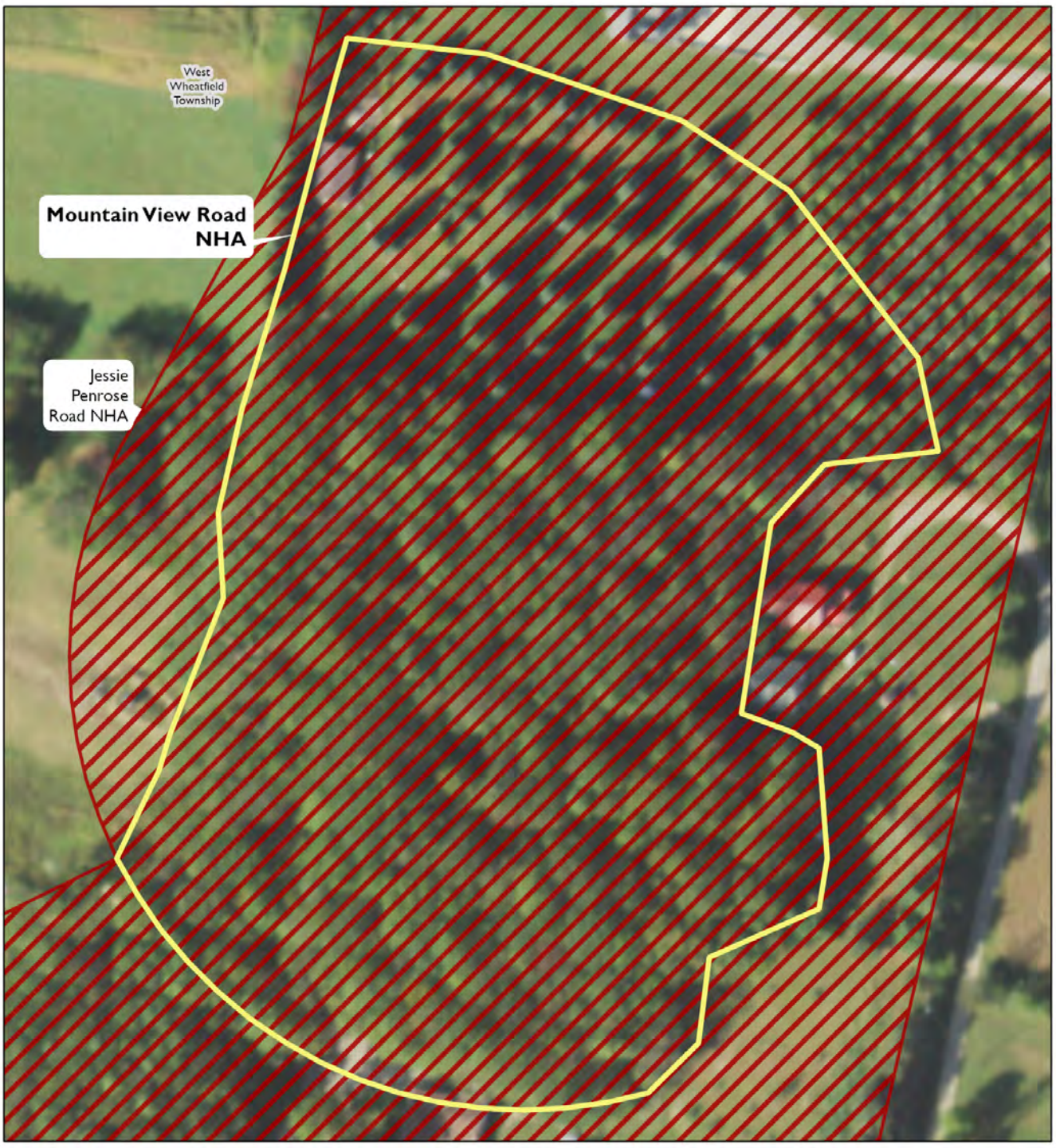
Municipalities: Indiana County: West Wheatfield Township

USGS quads: Bolivar
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 6 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Mountain View Road NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


West Wheatfield Township
Mountain View Road NHA
Jessie Penrose Road NHA
0 0.01 0.01 0.03 Miles
0 0.01 0.01 0.03 Kilometers
NHA Core Habitat
Other NHAs
N
PNHP
Pennsylvania Natural Heritage Program

Nashville Swamp NHA

A site of State Significance

On a floodplain of Little Mahoning Creek, near the mouth of Straight Run, is a **hemlock palustrine forest**. This swamp forest is characterized by a "drunken" stand of eastern hemlock (*Tsuga canadensis*) and yellow birch (*Betula alleghaniensis*) that tilt and lean, exposing roots on raised mounds of sphagnum moss. A rich diversity of wetland plants occupy the mucky understory, colonizing openings created by fallen trees that have grown too tall to be supported by the saturated substrate. This swamp also supports a population of **northern pygmy clubtail** (*Lanthus parvulus*), a dragonfly species whose nymphs live in spring runs and small creeks.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

A northern pygmy clubtail. Photo: Ben Coulter

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Northern Pygmy Clubtail (*Lanthus parvulus*)		G4G5	S4	–	–	2007	E
Hemlock Palustrine Forest	C	GNR	S3	–	–	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

The northern pygmy clubtails rely on high quality groundwater, and on the cool microclimate provided by the hemlocks. Hemlocks are threatened by hemlock woolly adelgid (Adelges tsugae). Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- The westward invasion of the hemlock woolly adelgid (Adelges tsugae), currently documented in all but 3 counties in Pennsylvania, poses a potential threat to the hemlock trees in the region. The hemlock woolly adelgid, native to Asia, is a sap-feeding insect that attacks both the eastern hemlock and the Carolina hemlock (*Tsuga* caroliniana). This insect pest can result in high levels of hemlock mortality, opening up the forest canopy and illuminating the forest floor to full sunlight. Loss of the adjacent hemlock forest would impact the hydrologic regime and the microclimate of the wetland. Consider developing a management plan for treating hemlocks infested with wooly adelgid at this site using integrated pest management (IPM) approaches that combine biological controls, targeted insecticides, and silvicultural practices; see the PA DCNR informational website for more management details, (DCNR 2018).
- The northern pygmy clubtail depends upon high groundwater quality, the regulation of water temperature levels provided by forest cover, and the seasonal input of detritus and other organic material supplied from the forest. Excess input of nutrients from human activities in the watershed causes bacterial growth that reduces the oxygen content of the water. Timber harvesting may increase erosion and siltation, and cause a decrease in dissolved oxygen as canopy cover is removed and water temperature rises. Maintain canopy cover within the swamp and the upslope area. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation

strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Grant Township, Canoe Township

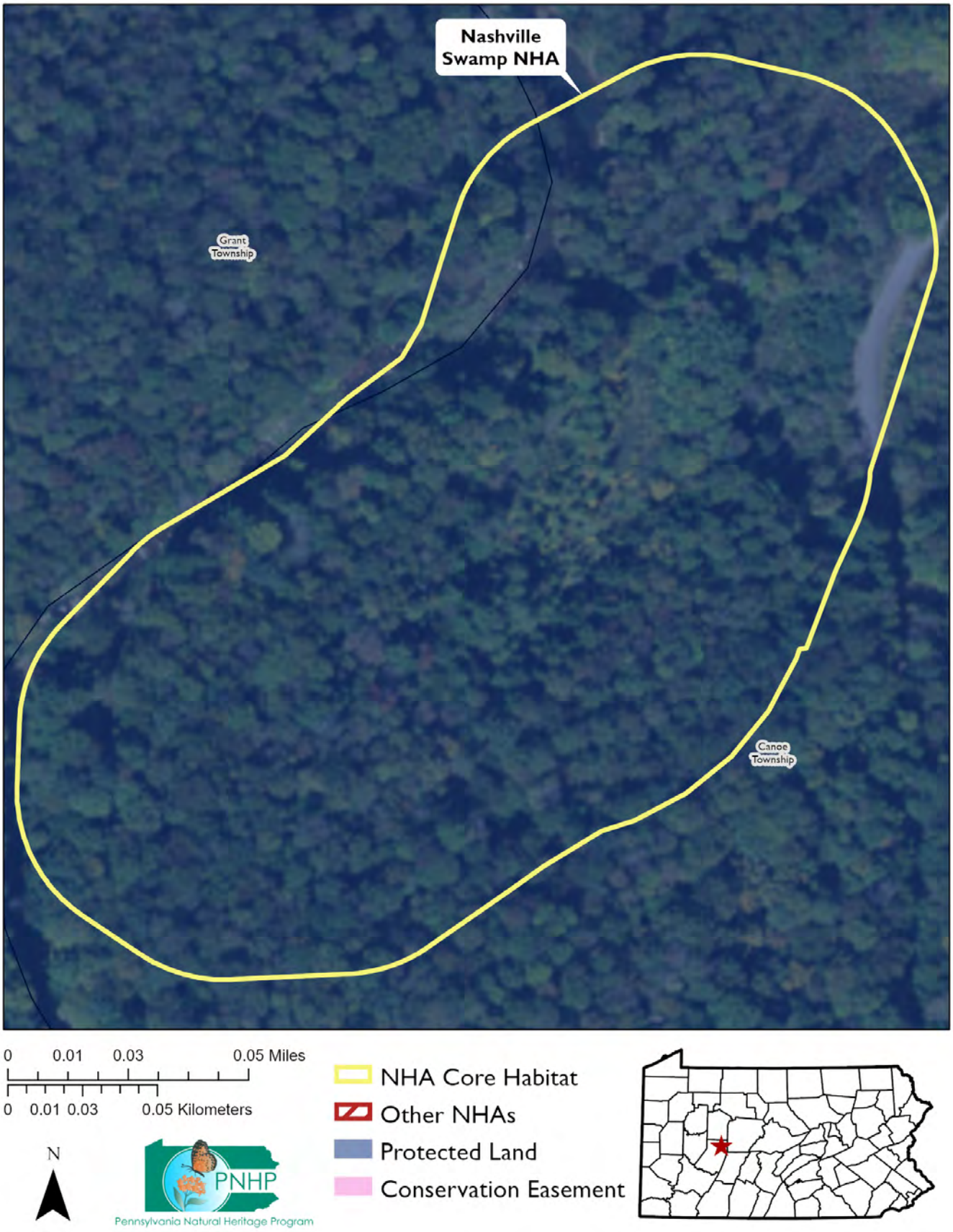
USGS quads: Rochester Mills
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: State Game Land 262
Approximate Acreage: 121 acres

References

DCNR, PA (2018). *Hemlock Woolly Adelgid*. URL: http://www.dcnr.pa.gov/Conservation/ForestsAndTrees/InsectsAndDiseases/HemlockWoollyAdelgid/Pages/default.aspx (visited on 04/27/2018).

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Nashville Swamp NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Nashville
Swamp NHA
Grant
Township
Canoe
Township
0 0.01 0.03 0.05 Miles
0 0.01 0.03 0.05 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

North Branch Plum Creek NHA

A site of State Significance

This stretch of the North Branch of Plum Creek supports the **least brook lamprey** (*Lampetra aepyptera*), as well as more common fish such as creek chub (*Semotilus atromaculatus*), white sucker (*Catostomus* commersoni), and Johnny darter (*Etheostoma nigrum*). The **least brook lamprey** is a harmless, filter-feeding fish which should not be confused with its parasitic cousin the sea lamprey (*Petromyzon marinus*). This species relies on clean, clear creeks of small to moderate size, with both sandy/pebbly stretches with flowing water as well as still, muddy backwaters.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Least Brook Lamprey (*Lampetra aepyptera*)	G5	S4	PC	CR	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.
[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

Protecting water quality along the North Branch of Plum Creek will help the least brook lamprey and other species in the creek. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Overall fish abundance at this site is low, suggesting possible water quality problems. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads, reducing habitat quality for this fish species. Conserve and expand the forested riparian buffers of this waterway. Streams through forested areas should be considered high priority for conservation. The forested riparian corridor helps to regulate the temperature of the stream and creates streamside conditions that contribute to improved water quality and aquatic habitat. Streams through non-forested areas should be restored with native trees and shrubs appropriate to the habitat. Establish at least a 100 foot buffer of woody vegetation along the creek and its tributaries to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

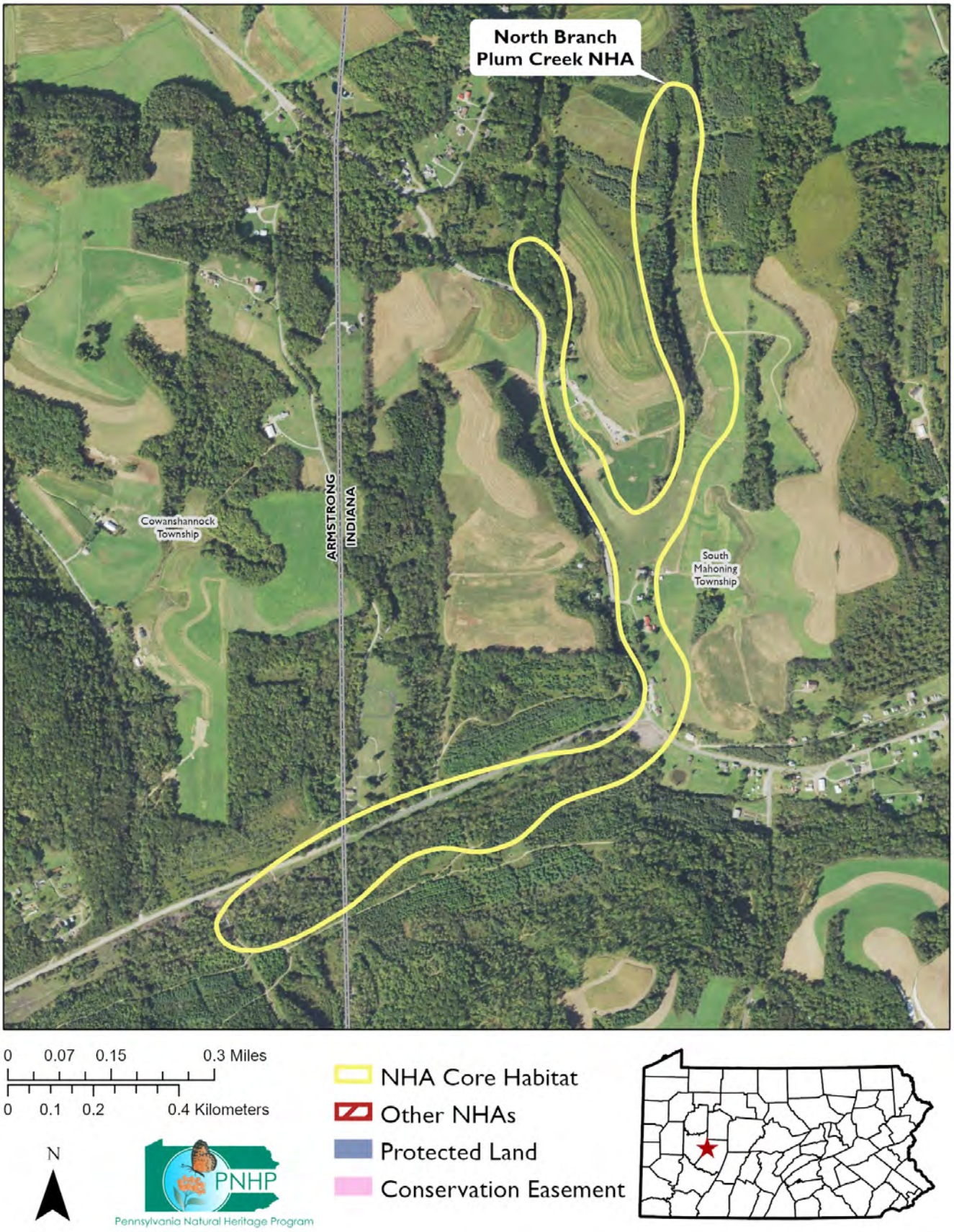
Location

Municipalities: Armstrong County: Cowanshannock Township; Indiana County: South Mahoning Township
USGS quads: Plumville
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 99 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. North Branch Plum Creek NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


North Branch
Plum Creek NHA
ARMSTRONG
INDIANA
Cowanshannock
Township
South
Mahoning
Township
0 0.07 0.15 0.3 Miles
0 0.1 0.2 0.4 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Onberg NHA

A site of State Significance

Crooked Creek and some of its unnamed tributaries provide habitat for the **least brook lamprey** (*Lampetra aepyptera*). The surrounding landscape is primarily forested, or agricultural. **Least brook lamprey** spend 5-6 years in a larval stage, during which they feed on tiny particles of organic matter. Once they metamorphose into adults, in the late summer, they overwinter, spawn, and then die.

The least brook lamprey, a fish species of concern found in Crooked Creek. Photo: Fredlyfish4, Creative Commons

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Least Brook Lamprey (*Lampetra aepyptera*)	G5	S4	PC	CR	2003	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

Protect water quality in Crooked Creek to support this fish species. One of the major threats to the least brook lamprey is siltation, which often occurs as the result of poor agricultural practices, or development in the watershed. Protect forested buffers along streams. Additionally, increasing drought as a result of climate change may reduce water levels in small tributaries and impact habitat availability for this fish. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads, reducing habitat quality for this fish species. Conserve and expand the forested riparian buffers of this waterway. Streams through forested areas should be considered high priority for conservation. The forested riparian corridor helps to regulate the temperature of the stream and creates streamside conditions that contribute to improved water quality and aquatic habitat. Streams through non-forested areas should be restored with native trees and shrubs appropriate to the habitat. Establish at least a 100 foot buffer of woody vegetation along the creek and its tributaries to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.
- Increased drought, as a result of climate change, could lead to decreased water levels and reduce habitat availability for this fish. Minimize other threats to maximize this species' resiliency to climate change. Create a plan for assessing predicted and current climate change impacts to water levels in the aquatic habitats this species relies on in Pennsylvania.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Rayne Township, White Township, Cherryhill Township

USGS quads: Clymer

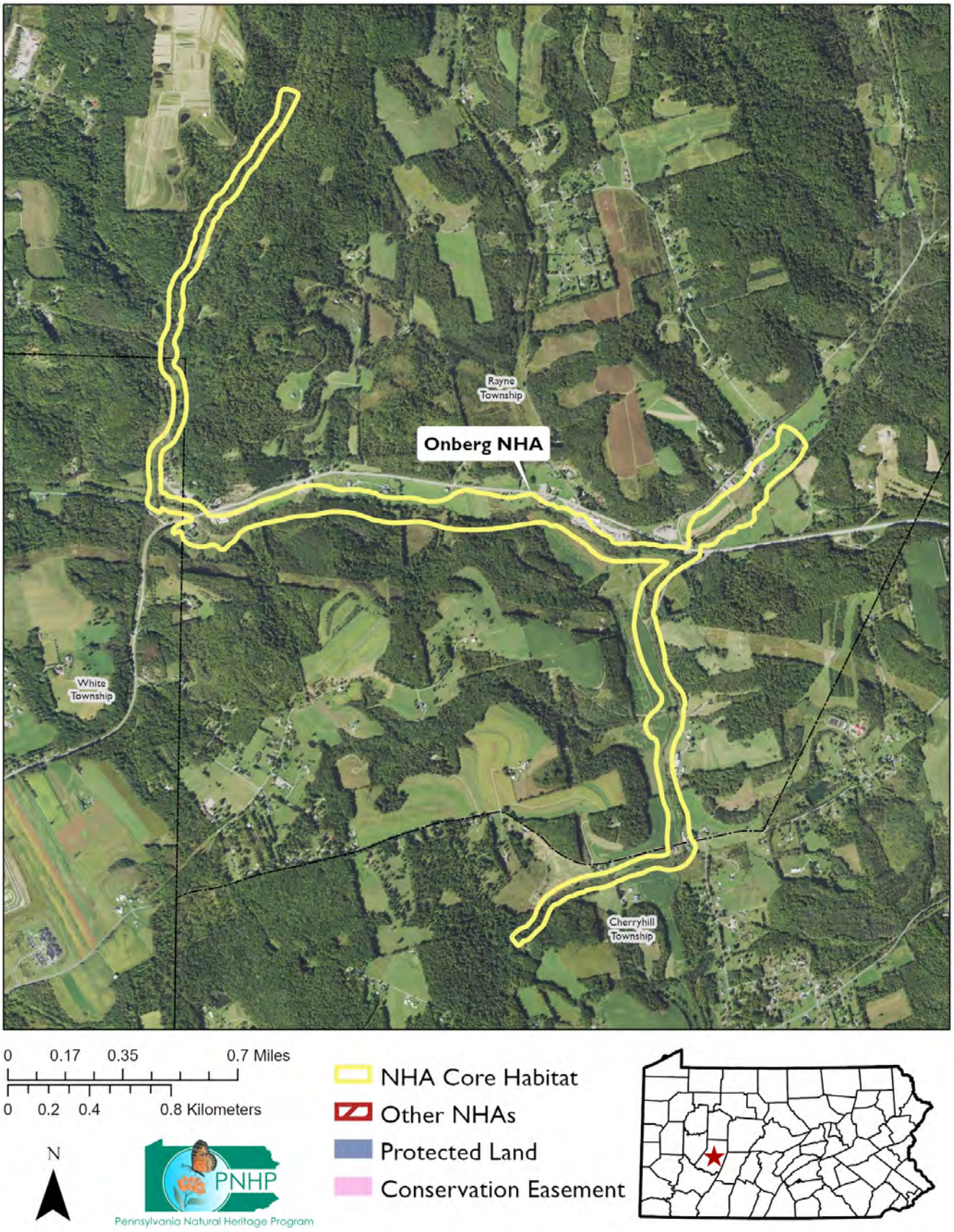
Previous CNHI reference: This site does not overlap a previously published site.

Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 196 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Onberg NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Rayne Township
Onberg NHA
White Township
Cherryhill Township
0 0.17 0.35 0.7 Miles
0 0.2 0.4 0.8 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

South Branch Plum Creek NHA

A site of State Significance

The South Brach of Plum Creek supports several species of concern. There is a small population of the Pennsylvania endangered **Wabash pigtoe** (*Fusconaia flava*), a freshwater mussel, as well as a population of the **least brook lamprey** (*Lampetra aepyptera*). This small, rare, native lamprey does not harm other fish, and should not be confused with the invasive sea lamprey (*Petromyzon marinus*). A patch of forest near the river provides nesting trees for a rookery (nesting colony) of **great blue heron**s s(*Ardea herodias*). The herons forage for fish and other prey in the creek and in other nearby bodies of water. Lowlands along the creek provide habitat for **featherbells** (*Stenanthium gramineum*), a plant in the lily family.

The creek habitat has a mix of cobble, gravel and silt substrates. There was also bedrock in some locations. The stream runs through a steep-sloped agricultural valley. Some crop fields and livestock pastures occur very close to the stream. Evidence of past strip mines and low density homes were also seen.

a Wabash pigtoe. Photo: PNHP

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Great Blue Heron (*Ardea herodias*)		G5	S5B,S4N,S4M	–	–	2017	E
Least Brook Lamprey (*Lampetra aepyptera*)		G5	S4	PC	CR	2007	E
Wabash Pigtoe (*Fusconaia flava*)		G5	S2S3	–	PE	2007	D
Featherbells (*Stenanthium gramineum*)		G4G5	S4	N	W	2008	A

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

Siltation of this creek is a problem; the condition of the creek could be improved by allowing forested riparian buffers to grow along this creek and all of its tributaries. This stretch of creek has some riparian forest buffers, but mostly has inadequate riparian buffers or no buffers at all. Silt loads in the stream are heavy, and the viability of the Wabash pigtoe population is doubtful because of that. Most of the stream is not classified as impaired, but the upstream end of the site, and the reaches above it, are considered impaired by siltation caused by grazing and the removal of streamside vegetation. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Sedimentation is a main cause of the freshwater mussel declines throughout North America, because it renders stream bottoms unsuitable as mussel habitat. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants, such as heavy metals, pesticides, and abandoned mine drainage, have long been recognized as threats to mussels (Ortmann 1909; Williams et al. 1993). Increases in siltation can also indirectly impact freshwater mussel communities by interfering with host fish – mussel interactions. Increased sedimentation can reduce the abundance, diversity, and

reproduction of fish, including the host fish that are necessary for protection and dispersal of virtually all freshwater mussels during their larval stage. The increased turbidity associated with suspended sediment loads also interferes with the visual cues used by both adult mussels and host fish in the transfer of the glochidia, or mussel larvae (Box and Mossa 1999). Conserve and expand the forested riparian buffers of this waterway. Streams through forested areas should be considered high priority for conservation. The forested riparian corridor helps to regulate the temperature of the stream and creates streamside conditions that contribute to improved water quality and aquatic habitat. Streams through non-forested areas should be restored with native trees and shrubs appropriate to the habitat. Establish at least a 100 foot buffer of woody vegetation along the creek and its tributaries to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.

- The measures listed above will also improve the habitat for the great blue herons, because they rely on a healthy fish population, as well as for the least brook lamprey.
- Great blue heron rookeries vulnerable to human disturbance. Significant additional human disturbance within 305 meters (1000 feet) could trigger permanent abandonment of the area, although disturbance within the Core Habitat should not be a problem for this species if it occurs during the non-breeding season (September – February), as long as the trees in and around the rookery are left undisturbed.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Armstrong County: Plumcreek Township; Indiana County: Washington Township

USGS quads: Elderton, Ernest
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 531 acres

References

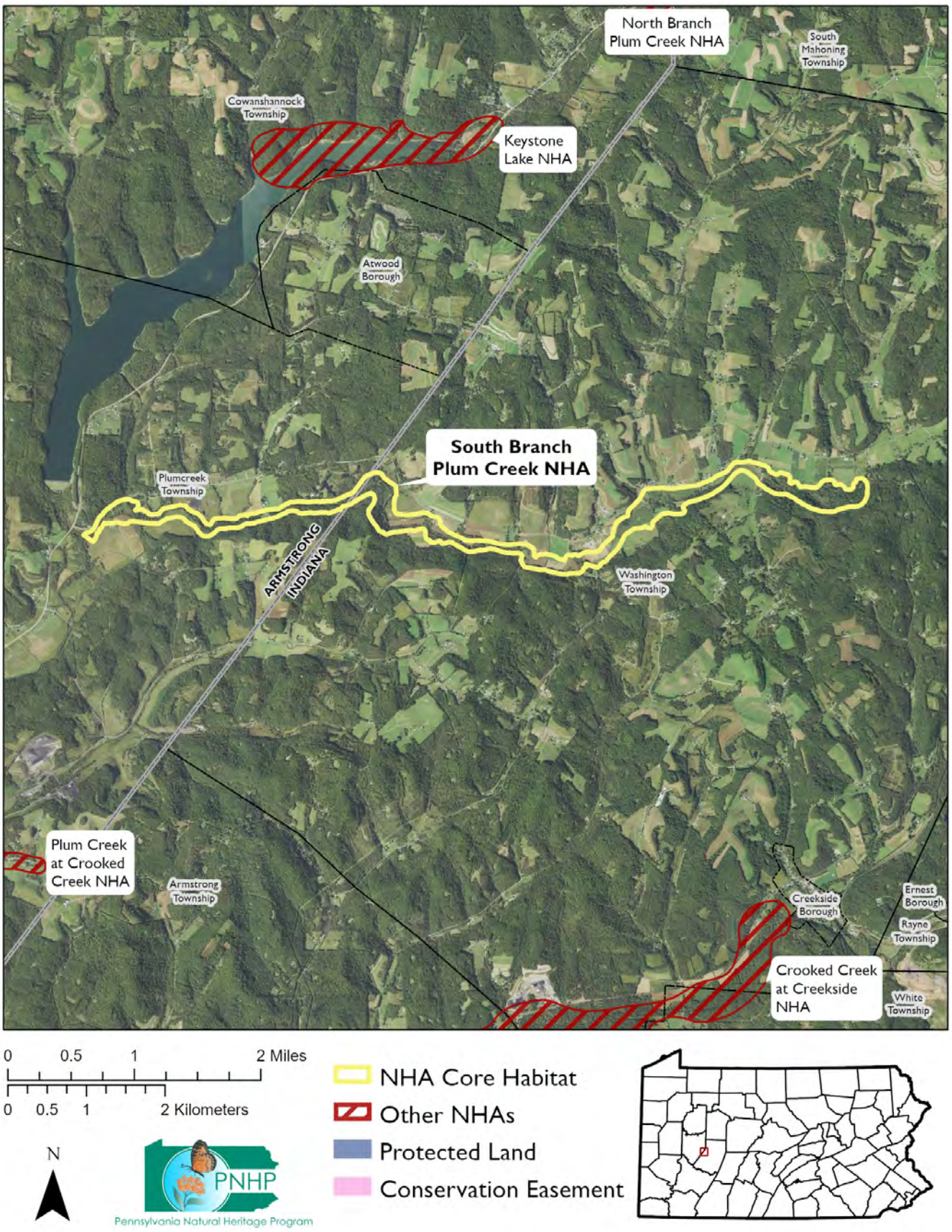
Box, Jayne Brim and Joann Mossa (Mar. 1999). "Sediment, Land Use, and Freshwater Mussels: Prospects and Problems". In: *Journal of the North American Benthological Society* 18.1, pp. 99–117. ISSN: 0887-3593, 1937-237X. DOI: 10.2307/1468011. URL: https://www.journals.uchicago.edu/doi/10.2307/1468011 (visited on 04/16/2018).

Ortmann, A.E. (1909). "The destruction of the fresh-water fauna in Western Pennsylvania". In: *Proceedings of the American Philosophical Society* 47.191, pp. 90–110.

Williams, J.D. et al. (1993). "Conservation status of freshwater mussels of the United States of Canada". In: *Fisheries* 18, pp. 6–22.

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. South Branch Plum Creek NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


North Branch
Plum Creek NHA
South
Mahoning
Township
Cowanshannock
Township
Keystone
Lake NHA
Atwood
Borough
South Branch
Plum Creek NHA
Plumcreek
Township
ARMSTRONG
INDIANA
Washington
Township
Plum Creek
at Crooked
Creek NHA
Armstrong
Township
Creekside
Borough
Ernest
Borough
Rayne
Township
Crooked Creek
at Creekside
NHA
White
Township
0 0.5 1 2 Miles
0 0.5 1 2 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

South Branch Two Lick Creek NHA

A site of Regional Significance

This stretch of Two Lick Creek, along with its tributaries Repine Run and Sides Run, supports the **least brook lamprey** (*Lampetra aepyptera*) and a sensitive species of concern. The **least brook lamprey** is a harmless filter-feeding fish, and should not be confused with its parasitic, invasive relative, the sea lamprey (*Petromyzon marinus*).

Least brook lamprey live in creeks with rocky and sandy riffles, and which also have pockets of mud or other soft sediments Photo: FredlyFish4, Creative Commons

Rich, mesic riparian forest here are dominated by trees such as sugar maple (*Acer saccharum*), eastern hemlock (*Tsuga canadensis*), and black cherry (*Prunus serotina*). Dominant herbs include intermediate woodfern (*Dryopteris intermedia*), blue cohosh (*Caulophyllum thalictroides*), Canada mayflower (*Maianthemum canadense*), wakerobin (*Trillium erectum*), and northern sweet violet (*Viola blanda*). These forests support an additional two sensitive species of concern.

This site is of Regional significance. It has been assigned this significance level because of the occurrence of a sensitive species of concern that is of G3 rank.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Least Brook Lamprey (*Lampetra aepyptera*)		G5	S4	PC	CR	2007	E
Sensitive Species of Concern A[3]	S	–	–	–	–	2005	E
Sensitive Species of Concern B[3]	S	–	–	–	–	2008	CD
Sensitive Species of Concern C[3]	S	–	–	–	–	2008	D

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

The surrounding landscape here is primarily agricultural, although the majority of the forested riparian buffer along the creek remains intact. Protect water quality, and allow the rich mesic forests to continue to mature. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- The sensitive aquatic species of concern depends on clean, cold, well-oxygenated water which maintains its historic seasonal flow regime. Changes to water quantity and quality as a result of land use change which increases sediment input, nutrients, or pollutants, modifies the pH, or increases thermal pollution (e.g. through damming or loss of forested riparian buffers) will negatively affects this species. Both aquatic species of concern are vulnerable to siltation from erosion. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads, reducing habitat quality for this fish species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 foot) buffer of native woody vegetation where it exists along the waterways and wetlands and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Avoid damming rivers, or other activities which alter flow regimes.
- Over-browsing by white-tailed deer is a serious threat to the overall understory plant diversity, as well as to the two terrestrial species of concern. An overabundance of deer can create the effect of park-like forests in which the understory and vertical stratification is greatly reduced. The loss of understory species eliminates habitat for some nesting songbirds as well as increasing competition between deer and other wildlife due to reduced food sources. Reduction of deer populations to control overgrazing, or maintenance of low deer populations at this site, may be necessary to maintain site diversity. Uncommon species of native plants are particularly susceptible to deer herbivory.
- Fragmentation of the forested canopy can have a negative impact on the habitat supporting the species of concern found at this location by creating open conditions favorable for invasive plant colonization, and drying the habitat by

allowing sunlight and wind to desiccate the soil. Avoid fragmenting the existing forested areas with additional buildings or infrastructure. Avoid logging in this area except as it relates to invasive species removal. The forest cover should be allowed to achieve and maintain old-growth characteristics.

- Aggressive non-native plant species are a particular threat to species in calcareous habitats. Left to spread, these species can crowd out the species of concern, as well as other native plant species. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try to repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. Continual invasive species monitoring and control will likely be necessary (McPherson 2013).

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Green Township, Pine Township

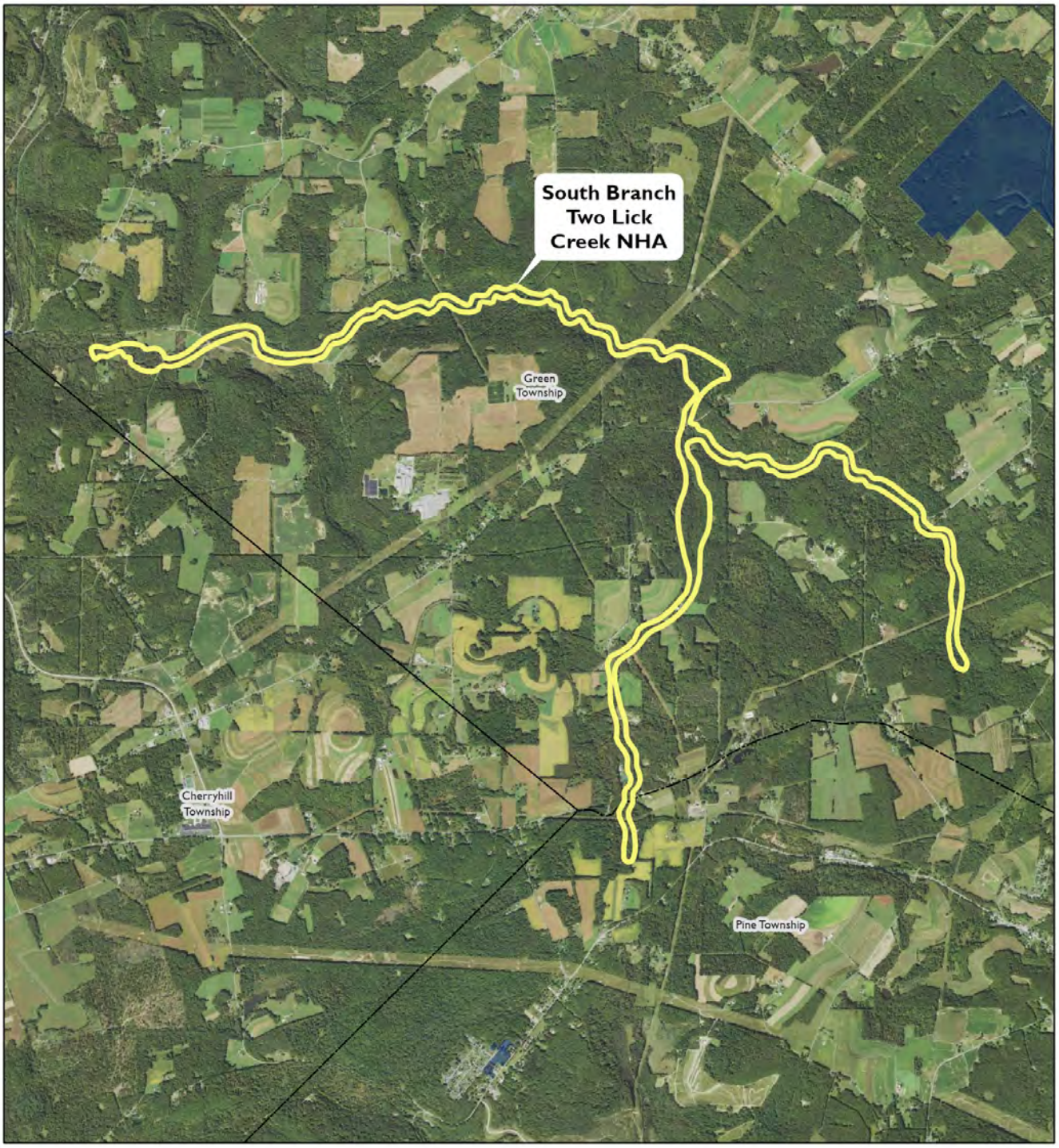
USGS quads: Barnesboro, Commodore
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 282 acres

References

McPherson, J. I. (2013). *Conservation Assessment of Calcareous Ecosystems*. Report to Wild Resources Conservation Program Grant #10391. Pittsburgh, Pennsylvania: Pennsylvania Natural Heritage Program, p. 152.

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. South Branch Two Lick Creek NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx



0 0.35 0.7 1.4 Miles

0 0.4 0.8 1.6 Kilometers

N

PNHP

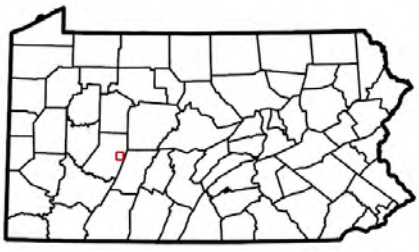
Pennsylvania Natural Heritage Program

NHA Core Habitat

Other NHAs

Protected Land

Conservation Easement



State Game Land #153 NHA

A site of Regional Significance

State Game Land #153 protects the northern end of Chestnut Ridge. This site contains a limestone solutional cave, Strangford Cave, in its southwestern corner. This cave, once disturbed by recreational users, has now been gated, which protects the sensitive species found within it. Dry rocky outcrops and mid to late successional forest cover the majority of the rest of this site. Canopy gaps due to ash (*Fraxinus* spp.) die-back and natural tree falls allow for forest regeneration, and provide habitat for a large and healthy population of **thick-leaved meadow-rue** (*Thalictrum coriaceum*), which is generally found in rocky, open woodland habitats. **Roundleaf groundsel** (*Packera obovata*) also grows in the rocky, open woodlands here; while this species is not considered particularly rare, it is an important host plant for the northern metalmark (*Calephelis borealis*), a globally vulnerable butterfly species. The rocky outcrops throughout this site also provide habitat for the **Allegheny Woodrat** (*Neotoma magister*).

Silver-haired bats roost in mature trees. Photo: LassenNPS, Creative Commons

This site is of Regional significance. It has been assigned this significance level because of the occurrence of at least two globally vulnerable (G3) species, such as Allegheny Woodrat (*Neotoma magister*), within this NHA.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status[1]	PABS Status[1]	Last Observed	Quality[2]
Silver-haired Bat (*Lasionycteris noctivagans*)		G3G4	S1	–	CR	2007	E
Allegheny Woodrat (*Neotoma magister*)		G3G4	S2	PT	PT	2013	E
Roundleaf Groundsel (*Packera obovata*)		G5	SNR	–	SP	2018	E
Thick-leaved Meadow-rue (*Thalictrum coriaceum*)		G4	S2	PE	PT	2018	A
Sensitive Species of Concern A[3]		–	–	–	–	1999	E
Sensitive Species of Concern B[3]		–	–	–	–	2007	E
Sensitive Species of Concern C[3]		–	–	–	–	2000	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

This site consists of a cave, which is extremely sensitive to disturbance, as well as rocky forests and woodlands. Quarrying, logging, and recreational activities are a threat to the rare species here, many of which are quite sensitive to human disturbances. While the majority of this NHA is protected from development, efforts should be made to allow forests to mature, undisturbed, and to continue to limit human access to the cave. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- *Thalictrum coriaceum* is rare through much of its range, and because it requires particularly undisturbed forest habitat, it is very sensitive to human impacts. It is also known to be threatened by deer browse and invasive species. Recovery of thick-leafed meadow rue in Pennsylvania will require preservation and protection of unaltered woodlands within the plant's historical range. Limit disturbances near populations. Consider deer population management, as well as invasive species management near occurrences, if necessary.
- Aggressive non-native plant species are a particular threat to species in calcareous habitats. Left to spread, these species

can crowd out the species of concern, as well as other native plant species. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try to repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. Continual invasive species monitoring and control will likely be necessary (McPherson 2013).

- Cave dwelling organisms are sensitive to even minor disturbances to the water quality and cave environment. Streams and surface runoff enter sinkholes and caves, bypassing natural filtration through soil and sediment. In addition, the porous carbonate bedrock typical of karst topography allows solid and liquid wastes to seep into caves and groundwater. Storm water management measures such as the creation of detention basins or vegetated swales should be implemented to slow and capture water flow in developed areas around the cave. Conservation efforts should focus on protecting and improving the quality of the surface and ground water for native plants and animals and species of concern. Sinkholes within the area should be considered direct conduits to the groundwater and should be protected from above ground sources of pollution. Sinkholes should be buffered with native vegetation to help slow the flow of water before it enters the sinkhole. Water that is reduced in velocity will drop sediment and other heavy particles as it slows down.
- Alteration of cave entranceways such as vegetation removal and structural changes, such as closure, can affect climatic conditions in the cave, including airflow, temperature, and humidity. Cave entrances should be buffered from disturbance by at least 160 meters (525 feet).
- The silver-haired bat relies on intact, interior forest habitat with many large, old trees and standing snags for foraging and roosting. Fragmentation as a result of human developments, or logging, are threats to this species. Avoid the removal of large native trees with naturally exfoliating bark such as shagbark hickory, and allow snags or dying trees to persist upon the landscape as these provide suitable summer roost areas for bats and other animal species.
- The decline of the American chestnut (*Castanea dentata*) after the introduction of chestnut blight (*Endothecia parasitica*) is thought to have played a role in the decline of Allegheny woodrats. These trees were formerly an important food source for woodrats, producing a much more reliable crop of nuts than other trees. Blight-resistant American chestnut trees should be planted at this site, and the survival of the trees should be monitored to ensure the success of the reintroduction. For more information, see the website of resources on the American chestnut maintained by the Pennsylvania chapter of The American Chestnut Foundation, linked in the references, below (PA-TACF 2019).
- Raccoon roundworm (*Baylisascaris procyonis*) is prevalent in many parts of Pennsylvania, and is often lethal to Allegheny woodrats. Raccoons are the primary host for the worm, but domestic dogs can also carry it. Roundworm levels in raccoons near this site should be monitored, and if levels are high then a program to treat raccoons with drugged bait pellets could be initiated.
- Acorns are a major part of the diet of Allegheny woodrats, but their production can be reduced by gypsy moths (*Lymantria dispar*), an introduced species that eats the leaves of oaks and other trees. Oaks may be stressed by the moths, reducing their crops of acorns, or they may be killed after several rounds of defoliation. Gypsy moths should be monitored at this site, and if present at high levels control methods should be considered. For more information on gypsy moth control methods, see the Pennsylvania Department of Conservation Natural Resources' maintained webpage on gypsy moth management. (Pennsylvania Department of Conservation Natural Resources 2019).

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: West Wheatfield Township, Burrell Township
USGS quads: Bolivar
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: State Game Land 153
Approximate Acreage: 1820 acres

References

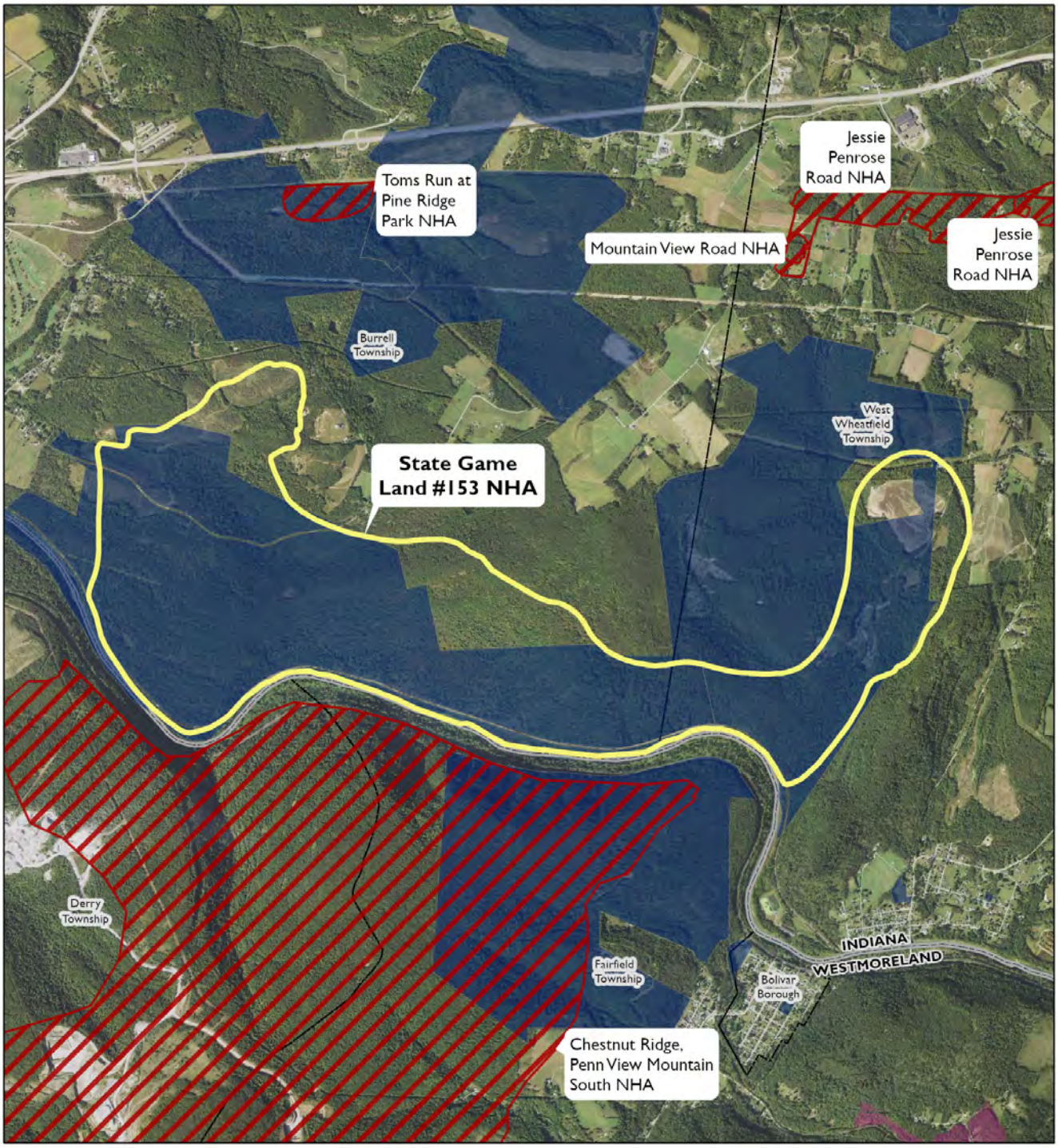
McPherson, J. I. (2013). *Conservation Assessment of Calcareous Ecosystems*. Report to Wild Resources Conservation Program Grant #10391. Pittsburgh, Pennsylvania: Pennsylvania Natural Heritage Program, p. 152.

PA-TACF (2019). *Resources and Links – PA/NJ Chapter of The American Chestnut Foundation PA*. URL: https://patacf.org/membership/resources/ (visited on 01/31/2019).

Pennsylvania Department of Conservation Natural Resources (2019). *Gypsy Moth*. Pennsylvania Department of Conservation and Natural Resources. URL: https://www.dcnr.pa.gov:443/Conservation/ForestsAndTrees/InsectsAndDiseases/GypsyMoth/Pages/default.aspx (visited on 01/30/2019).

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. State Game Land #153 NHA. Created on 14 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Toms Run at Pine Ridge Park NHA
Jessie Penrose Road NHA
Mountain View Road NHA
Jessie Penrose Road NHA
Burrell Township
West Wheatfield Township
State Game Land #153 NHA
Derry Township
Fairfield Township
INDIANA
WESTMORELAND
Bolivar Borough
Chestnut Ridge, Penn View Mountain South NHA
0 0.3 0.6 1.2 Miles
0 0.35 0.7 1.4 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

State Game Land #273 NHA

A site of State Significance

This stretch of Yellow Creek, and the adjacent streamside habitat, supports a sensitive species of concern. This site also provides habitat for the **tiger spiketail** (*Cordulegaster erronea*), a dragonfly species of concern. **Tiger spiketail**s breed in small, clean spring runs, so at this site they are probably breeding in small tributaries, rather than the main creek.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

A perching tiger spiketail. Photo: Reuven Martin, Creative Commons

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Tiger Spiketail (*Cordulegaster erronea*)		G4	S3	–	–	2007	AC
Sensitive Species of Concern A[3]	S	–	–	–	–	2015	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

The best way to maintain the species of concern at this site would be to mitigate the abandoned mine drainage that is affecting the creek. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Both species of concern rely on clean water. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants such as heavy metals, pesticides, and abandoned mine drainage are potential threats to these species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 feet) buffer of native woody vegetation where it exists along the waterways and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Avoid fragmenting the remaining forested areas with additional buildings or infrastructure. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should also be applied to the surrounding area. This section of Yellow Creek is classified as Impaired by abandoned mine drainage. The sources of the this drainage in several tributaries of Yellow Creek should be mitigated.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: White Township, Center Township, Brush Valley Township

USGS quads: Brush Valley, Indiana

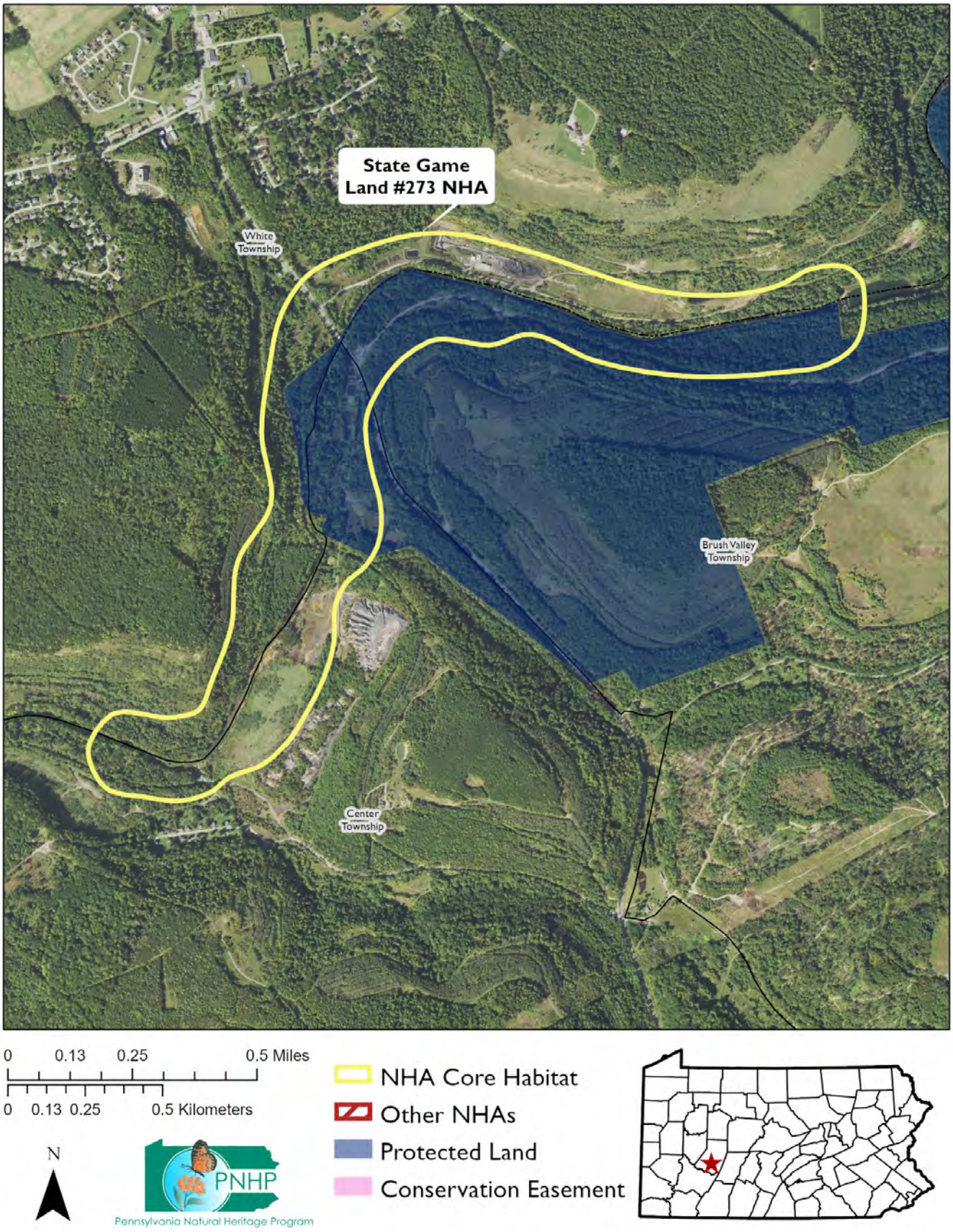
Previous CNHI reference: This site does not overlap a previously published site.

Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: State Game Land 273
Approximate Acreage: 277 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. State Game Land #273 NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


State Game Land #273 NHA
White Township
Brush Valley Township
Center Township
0 0.13 0.25 0.5 Miles
0 0.13 0.25 0.5 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

State Game Land #276 NHA

A site of State Significance

This NHA is primarily forested, with some early successional habitat at the northern end of the site near Graceton. An approximately one and a half mile section of Blacklick Creek flows through this area. Natural gas wells have been placed throughout the site, fragmenting the forested habitat. A large population of **bushy bluestem** (*Andropogon glomeratus*), a plant species of concern, was documented growing in early successional habitats. An additional sensitive species of concern is supported by the forested habitat.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Bushy Bluestem (*Andropogon glomeratus*)		G5	S3	TU	PR	2012	E
Sensitive Species of Concern A[3]	S	–	–	–	–	2013	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

State Game Land #276 comprises the central portion of this NHA, with either end being primarily privately owned. Although the publicly owned lands may be protected from some larger disturbances, these areas have been fragmented by natural gas development and utility rights-of-way. Limit further fragmentation of the forested habitat and maintain early successional habitat known to support bushy bluestem. The mix of early successional and mature forest at this site provide habitat to the two rare species. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Over-browsing by white-tailed deer is a serious threat to the overall understory plant diversity. An overabundance of deer can create the effect of park-like forests in which the understory and vertical stratification is greatly reduced. The loss of understory species eliminates habitat for some nesting songbirds as well as increasing competition between deer and other wildlife due to reduced food sources. Reduction of deer populations to control overgrazing, or maintenance of low deer populations at this site, may be necessary to maintain site diversity. Uncommon species of native plants are particularly susceptible to deer herbivory.
- Fragmentation of the forested canopy can have a negative impact on the habitat supporting the species of concern found at this location by creating open conditions favorable for invasive plant colonization, and drying the habitat by allowing sunlight and wind to desiccate the soil. Avoid fragmenting the existing forested areas with additional buildings or infrastructure. Avoid logging in this area except as it relates to invasive species removal. The forest cover should be allowed to achieve and maintain old-growth characteristics.
- Aggressive non-native plant species are a potential threat. Left to spread, these species can crowd out the species of concern, as well as other native plant species. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try to repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. Continual invasive species monitoring and control will likely be necessary.
- Degradation of water quality can have a negative impact on the habitat supporting the species of concern found at this location. The stormwater runoff from roadways, suburban development, and agriculture should be considered a potential source of significant contamination for the wetland habitat. Runoff from these sources has significantly higher levels of sediment, nutrients, pesticides, herbicides, and other pollutants than runoff filtered through a natural habitat. Maintaining a high quality aquatic habitat is important to the species of concern found at this location. Improve water quality and maintain the water quantity by protecting and enhancing existing aquatic habitats by monitoring water quality and enforcing protections. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area, including creating buffers

to protect wetlands and waterbodies from upland disturbances.

- Natural succession can convert open wetland habitats to closed canopy shrub swamps, eliminating critical habitat for the species of concern documented here. Action is needed to reverse the colonization of woody species. Cut trees and shrubs out of the primary wet meadow habitats to restore open canopied conditions. Once the open wet meadow habitat has been restored, grazing with pastoral animals or occasional mowing can be an effective tool to maintain open conditions.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

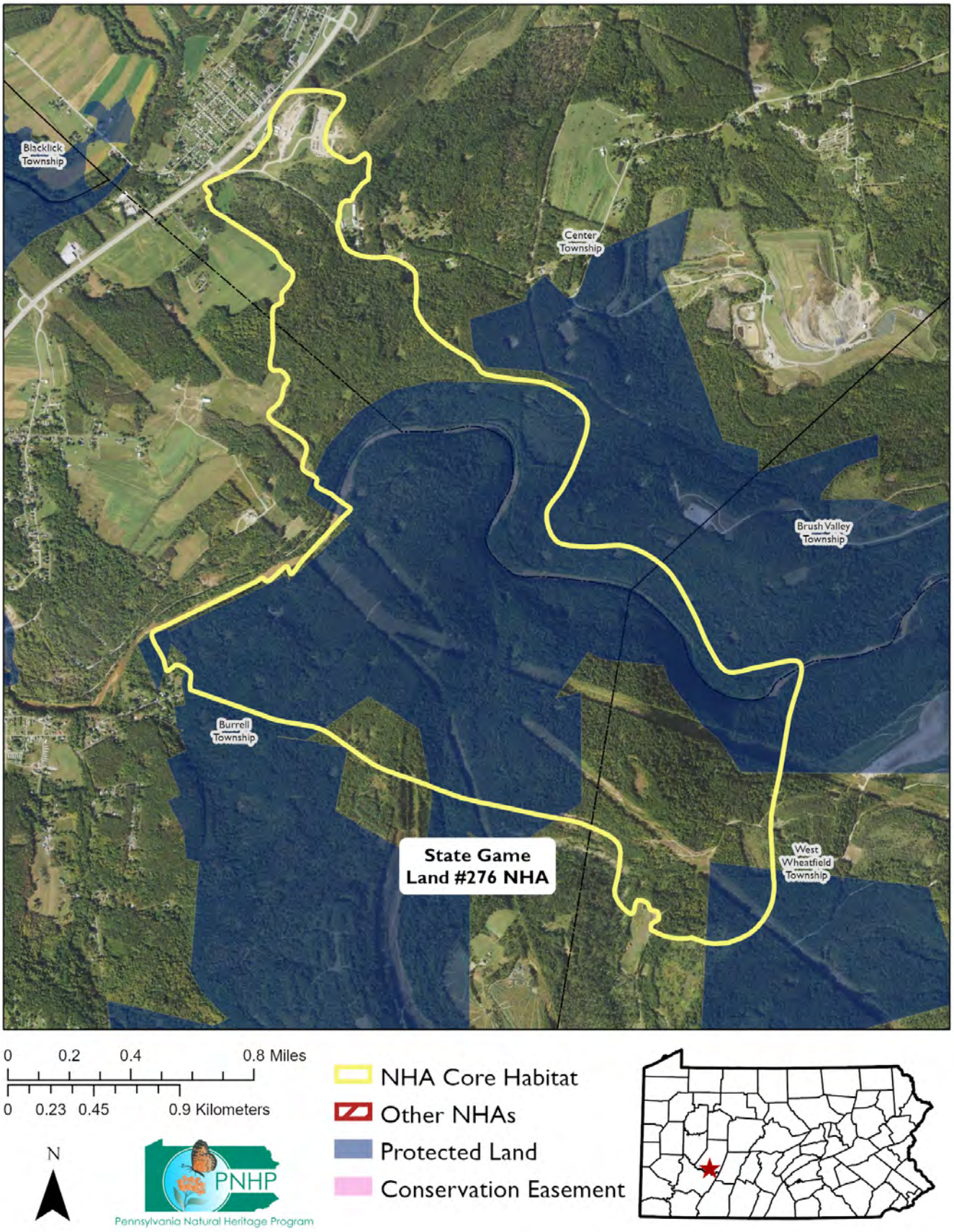
Location

Municipalities: Indiana County: West Wheatfield Township, Center Township, Brush Valley Township, Burrell Township
USGS quads: Bolivar, Indiana
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: State Game Land 276
Approximate Acreage: 1497 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. State Game Land #276 NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Blacklick Township
Center Township
Brush Valley Township
Burrell Township
West Wheatfield Township
State Game Land #276 NHA
0 0.2 0.4 0.8 Miles
0 0.23 0.45 0.9 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Toms Run at Pine Ridge Park NHA

A site of State Significance

The floodplain around Tom's Run at Pine Ridge Park has an older growth tulip tree (*Liriodendron tulipifera*) and sugar maple (*Acer saccharum*) forest, interspersed with oak species (*Quercus* spp.). The rich mesic slopes above the floodplain host numerous spring wildflower species. The base rich soils also allow the site to support a population of sensitive species of concern.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site being ranked G3G4, and also sensitive to collection or disturbance. Within Pennsylvania, these species may be severely declining.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2018	A

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

The base rich soils at this site are conducive to rapid invasions of non-native plants, especially along disturbed edges created from hiking trails or natural gaps in the forest canopy. Invasive plant species pose the most significant threat to long-term viability of this rare species at the site. Left to spread, invasive species can crowd out the species of concern, as well as native plant species. Overabundance of deer is also a threat to the habitat of the sensitive species of concern. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Aggressive non-native plant species are a particular threat to species in base-rich, calcareous habitats. Left to spread, these species can crowd out the species of concern, as well as other native plant species. Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal.
- Timber industry activities could directly disturb the habitat of this species. Avoid logging near known locations of this species. Conduct logging activities in such a way as to minimize disturbance as much as possible to forest structure and understory communities.
- Over-browsing by white-tailed deer is a serious threat to the overall understory plant diversity. An overabundance of deer can create the effect of park-like forests in which the understory and vertical stratification is greatly reduced. The loss of understory species eliminates habitat for some nesting songbirds as well as increasing competition between deer and other wildlife due to reduced food sources. Reduction of deer populations to control overgrazing, or maintenance of low deer populations at this site, may be necessary to maintain site diversity. Uncommon species of native plants are particularly susceptible to deer herbivory.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

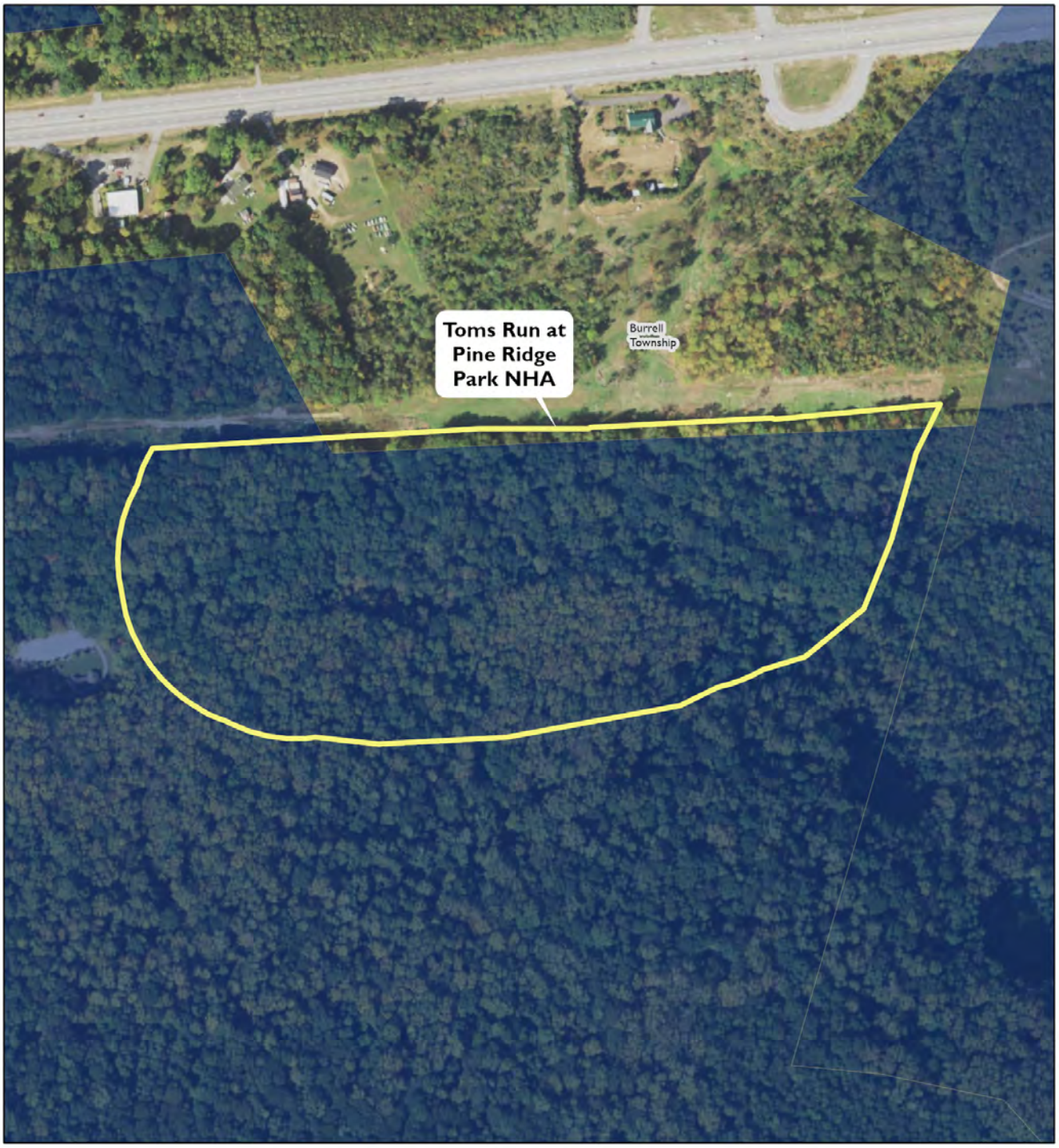
Municipalities: Indiana County: Burrell Township

USGS quads: Bolivar
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: Pine Ridge Park
Approximate Acreage: 34 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Toms Run at Pine Ridge Park NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Toms Run at Pine Ridge Park NHA
Burrell Township
0 0.03 0.07 0.13 Miles
0 0.04 0.07 0.15 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Two Lick Creek NHA

A site of State Significance

This section of Two Lick Creek flows through a developed landscape surrounded by residential structures, agriculture, and infrastructure. A sensitive species of concern that inhabits this site relies on high quality water and vegetated riparian buffers for both its diet and habitat. Many portions of this stretch of the creek are lacking both of these features. Preserving water quality should be the utmost priority for this site.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site being considered Secure (G5) or Apparently Secure (G4) at the global level, and also sensitive to collection or disturbance. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	S	–	–	–	–	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

Conservation efforts at this site should focus on improving water quality. This includes maintaining forested riparian buffers and mitigation sources of pollution upstream from the site that are impacting the water quality, including abandoned mine drainage and nutrient enrichment from urban or agricultural sources. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- The sensitive species of concern that inhabits this site has a specific diet of newly molted crayfish and depends on high water quality to maintain stable populations of its food source. Siltation and contaminants such as heavy metals, pesticides, and abandoned mine drainage are potential threats to this species. Increases in siltation due to erosion caused by deforestation, poor agricultural practices, or the destruction of riparian zones can directly and indirectly impact this species. Efforts should be made to maintain existing riparian zones and the supporting forested landscape as well as increase streambank vegetation in areas that are currently mowed or developed. Forested riparian buffers help to regulate stream temperatures and create streamside conditions that contribute to improved water quality as well as aquatic and terrestrial habitat.
- Conserve and expand the forested riparian buffers of all streams and wetlands within this NHA. Preserve at least a 100 meter (328 feet) buffer of native woody vegetation where it exists along the waterways and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution.
- Mitigate the effects of point source pollution such as abandoned mine drainage.
- Avoid fragmenting the remaining forested areas with additional buildings or infrastructure. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should also be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Center Township

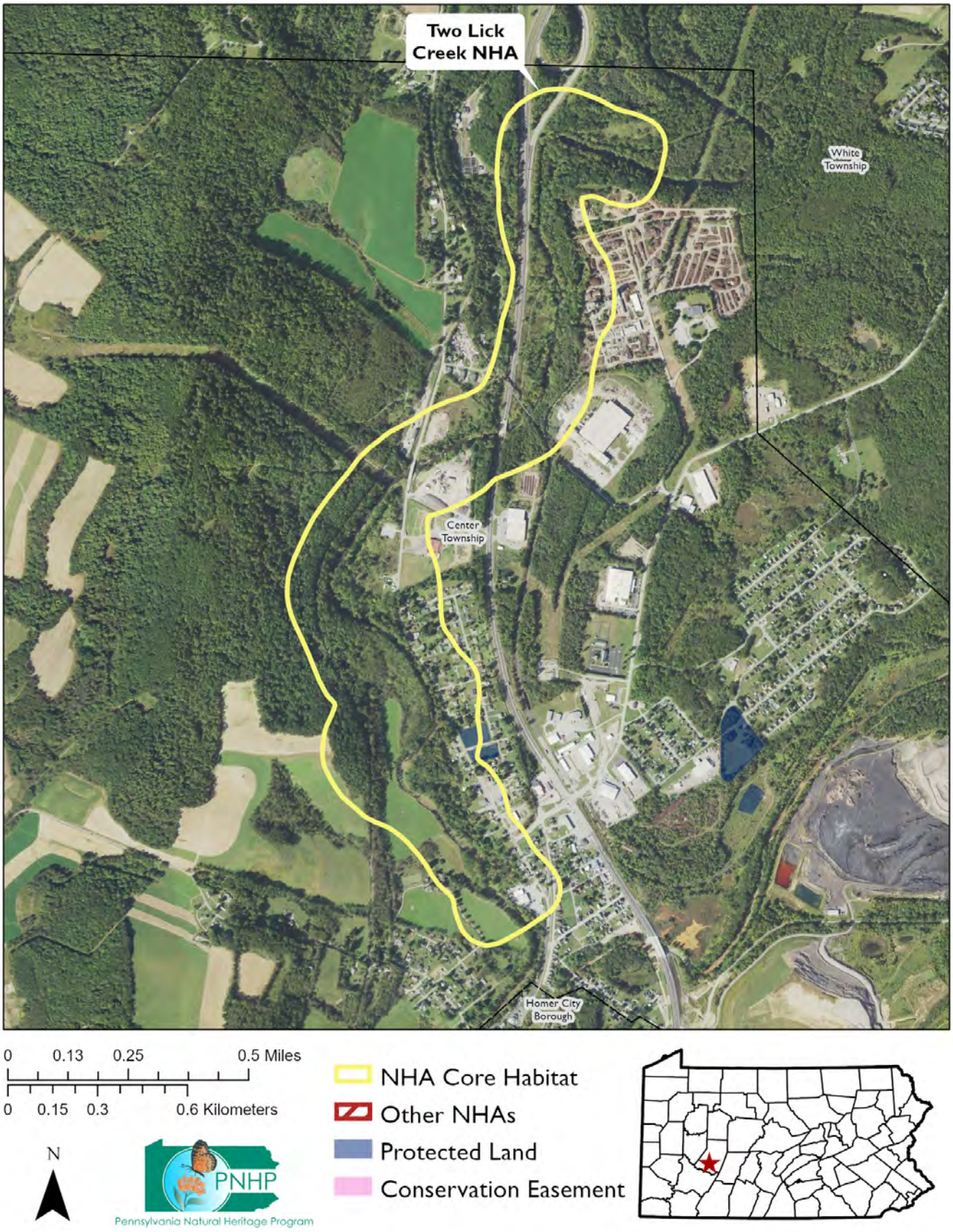
USGS quads: Indiana
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: Risinger Park

Approximate Acreage: 313 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Two Lick Creek NHA. Created on 13 Jan 2021.
Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Two Lick Creek NHA
White Township
Center Township
Homer City Borough
0 0.13 0.25 0.5 Miles
0 0.15 0.3 0.6 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Whiskey Run NHA

A site of State Significance

Whiskey Run is a partially forested stream that flows into the Blacklegs Creek. The stream has a rocky substrate that provides habitat for numerous crayfish. Whiskey Run also supports a population of a sensitive species of concern.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site being considered Secure (G5) or Apparently Secure (G4) at the global level, and also sensitive to collection or disturbance. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2012	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

The sensitive species of concern has a specific diet and depends on high water quality to maintain stable populations of its food source. Conserve the forested riparian buffers of all streams and wetlands. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should also be applied to the surrounding area. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- This species primarily eats a diet of newly molted crayfish and depends on high water quality to maintain stable populations of its food source. Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads and shifting, unstable stream bottoms. Siltation and contaminants such as heavy metals, pesticides, and abandoned mine drainage are potential threats to these species. Conserve the forested riparian buffers of all streams and wetlands. Conserve at least a 100 meter (328 feet) buffer of native woody vegetation where it exists along the waterways and establish at least a 30 meter (100 foot) buffer where it is lacking to help reduce erosion, sedimentation, and pollution. Avoid fragmenting the remaining forested areas with additional buildings or infrastructure. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should also be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

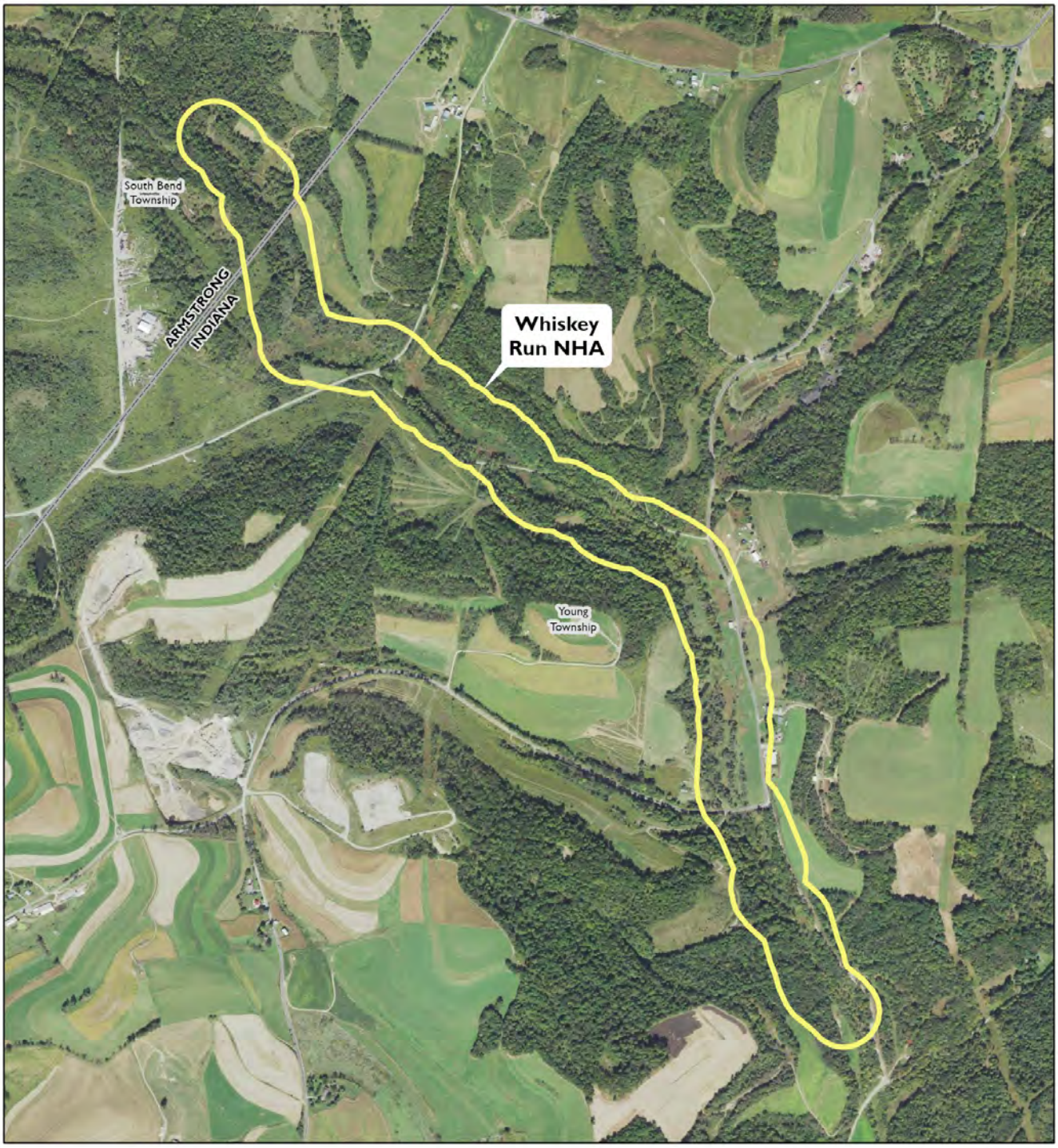
Municipalities: Armstrong County: South Bend Township; Indiana County: Young Township

USGS quads: Avonmore, Mc Intyre
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 175 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Whiskey Run NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


South Bend Township
ARMSTRONG
INDIANA
Whiskey Run NHA
Young Township
0 0.1 0.2 0.4 Miles
0 0.13 0.25 0.5 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

White's Woods NHA

A site of State Significance

This site is designated around a highly diverse stream valley located within White's Woods Nature Center. The presence of several of the herbaceous plant species here indicate that portions of this area have been minimally disturbed. The forest in this section is predominately composed of red oak (*Quercus rubra*), tulip poplar (*Liriodendron tulipifera*), black cherry (*Prunus serotina*), and sugar maple (*Acer saccharum*). This site supports a sensitive species of concern.

This site is of State significance. It has been assigned this significance level because of the tracked species at the site being ranked G3G4, and also sensitive to collection or disturbance. Within Pennsylvania, these species may be severely declining.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sensitive Species of Concern A[3]	**S**	–	–	–	–	2009	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

White's Woods is owned by White Township, which received the property as a donation. Plans to cut timber in the park have been opposed by the Friends of White's Woods, on the basis that timbering is not compatible with the terms of the donation. Some timbering has occurred, and the future of the park management is uncertain. A more detailed description of the property can be found here: https://sites.psu.edu/ecologistsnotebook/2017/05/25/signs-of-summer-2-whites-woods/ Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Invasive species are a major threat to this site, and to the species of concern. As with many urban parks, species such as Japanese honeysuckle (*Lonicera japonica*), Morrow's honeysuckle (*Lonicera morrowii*), garlic mustard (*Alliaria petiolata*), Japanese barberry (*Berberis thunbergii*) and oriental bittersweet (*Celastrus* orbiculata) are distributed throughout the site. Left to spread, invasive plants can crowd out native species. Management of these plants should be conducted. Ongoing monitoring and control will likely be necessary Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present.
- The species of concern grows in mature, minimally disturbed forest, and will decline or disappear if the habitat is heavily timbered. Additionally, invasive plants are often introduced and spread by timbering disturbances.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

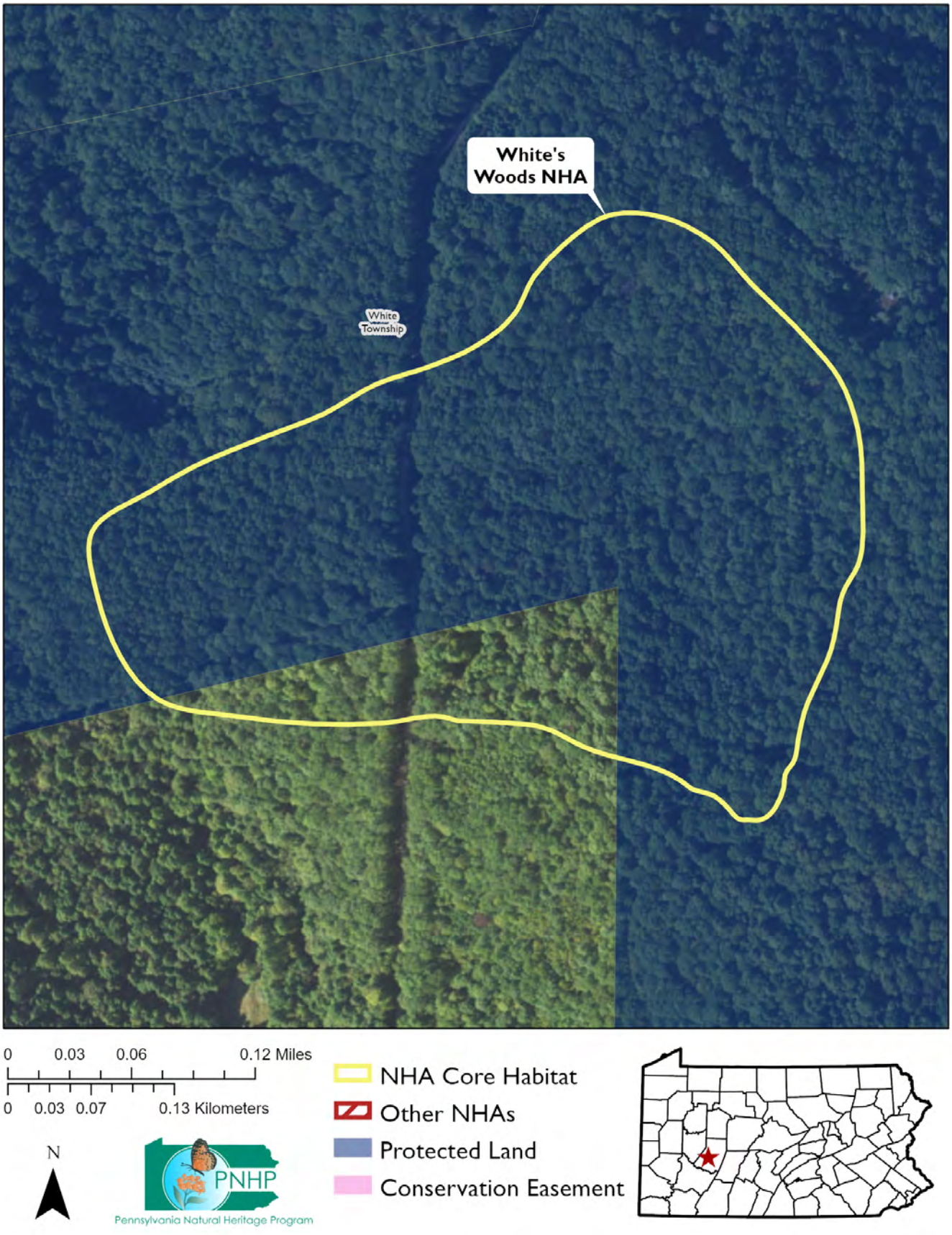
Municipalities: Indiana County: White Township

USGS quads: Ernest
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.
Overlapping Protected Lands: Iup Coop Recreation Park, Whites Woods Nature Center
Approximate Acreage: 43 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. White's Woods NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


White's Woods NHA
White Township
0 0.03 0.06 0.12 Miles
0 0.03 0.07 0.13 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Yellow Creek NHA

A site of State Significance

The stretch of Yellow Creek above Yellow Creek Lake supports the **least brook lamprey** (*Lampetra aepyptera*). This fish relies on clean, clear creeks of small to moderate size, with both sandy/pebbly stretches with flowing water as well as still, muddy backwaters. This harmless filter-feeding fish should not be confused with its cousin, the parasitic sea lamprey (*Petromyzon marinus*).

A least brook lamprey. Photo: FredlyFish4

Many other more common fish also occur here, including river chub (*Nocomis micropogon*), creek chub (Semotilis atromaculatus), western blacknose dace (*Rhinichthys obtusus*), longnose dace (*R. cataractae*), white sucker (*Catostomus* commersoni), northern hog sucker (*Hypentelium nigricans*), stonecat (Notorus flavus), brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), logperch (*Percina caprodes*), rainbow darter (*Etheostoma caeruleum*), fantail darter (*E. flabellare*), Johnny darter (*E. nigrum*), and mottled sculpin (*Cottus* bairdi).

This site is of State significance. It has been assigned this significance level because of the tracked species at the site, which are considered Secure (G5) or Apparently Secure (G4) at the global level. Within Pennsylvania, these species have limited numbers, due to occurring at the edge of their range or to loss of habitat.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name	Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Least Brook Lamprey (*Lampetra aepyptera*)	G5	S4	PC	CR	2007	E

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

Threats and Species Recommendations

The species of concern and other native aquatic species can be best maintained here by protecting water quality in the Yellow Creek watershed. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Erosion, whether caused by deforestation, poor agricultural practices, or the destruction of riparian zones, leads to increased silt loads, reducing habitat quality for this fish species. Conserve and expand the forested riparian buffers of this waterway. Streams through forested areas should be considered high priority for conservation. The forested riparian corridor helps to regulate the temperature of the stream and creates streamside conditions that contribute to improved water quality and aquatic habitat. Streams through non-forested areas should be restored with native trees and shrubs appropriate to the habitat. Establish at least a 100 foot buffer of woody vegetation along the creek and its tributaries to help reduce erosion, sedimentation, and pollution. Additionally, best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Cherryhill Township

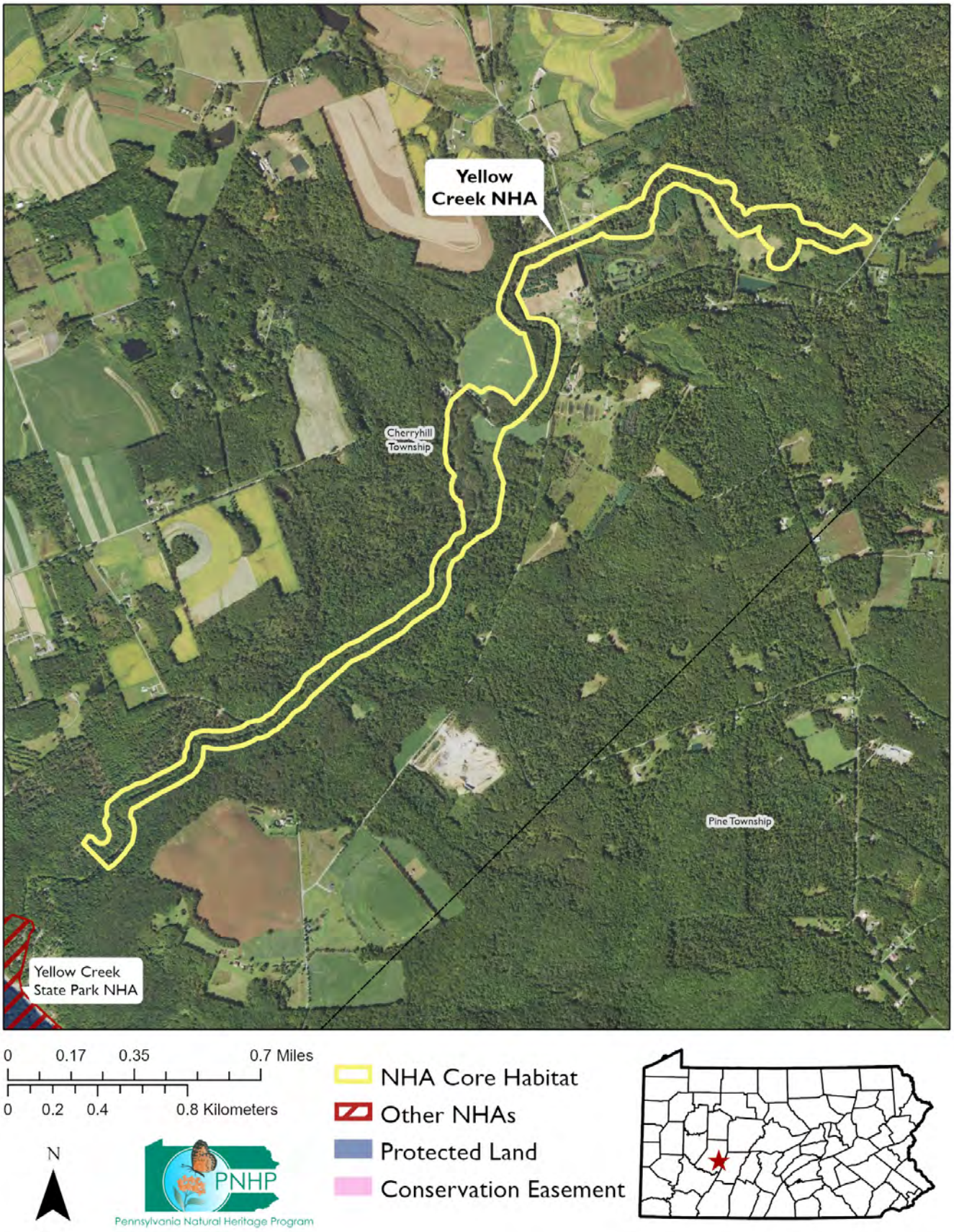
USGS quads: Strongstown
Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is not directly associated with another NHA.

Overlapping Protected Lands: This site is not documented as overlapping with any Federal, state, or locally protected land or conservation easements.
Approximate Acreage: 145 acres

References

This Natural Heritage Area was developed as part of an update to the Southwest Pennsylvania Commission with funding from the DCNR Community Conservation Partnership Program.

Please cite this Natural Heritage Area as:
Pennsylvania Natural Heritage Program. 2021. Yellow Creek NHA. Created on 13 Jan 2021. Available at: http://www.naturalheritage.state.pa.us/inventories.aspx


Yellow Creek NHA
Cherryhill Township
Pine Township
Yellow Creek State Park NHA
0 0.17 0.35 0.7 Miles
0 0.2 0.4 0.8 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement

Yellow Creek State Park NHA

A site of Global Significance

The rich mesic floodplains of Yellow Creek and Little Yellow Creek, and the adjacent forested slopes, are habitat for the West Virginia white (*Pieris virginiensis*), a butterfly species of concern. In April and May the adults can be observed nectaring on a wide variety of spring wildflowers, and laying their eggs on two-leaved toothwort (*Cardamine diphylla*) and cut-leaved toothwort (*Cardamine concatenata*). The forests also support two sensitive species of concern. A third sensitive species of concern relies on a combination of upland forest and scrubland.

A sora Photo: Becky Matsubara

The lower stretch of Little Yellow Creek, and the stretch of Yellow Creek just above the reservoir, support two sensitive species of concern, as well as the **sable clubtail** (*Stenogomphurus rogersi*), a dragonfly species of concern. Although the damming of Yellow Creek to create Yellow Creek Lake destroyed habitat for the species of concern here, it created habitat for several other species of concern. Marshes around the edge of the lake support the **tule bluet** (*Enallagma carunculatum*), a damselfly, as well as the **sora** (*Porzana carolina*), a marsh-nesting bird. Other marsh-nesting birds, such as the Virginia rail (*Rallus limicola*) and least bittern (*Ixobrychus exilis*) have been known to nest here, but have not done so in recent years.

This site is of Global significance. It has been assigned this significance level because of the presence of a globally rare species, such as West Virginia White (*Pieris virginiensis*), which occurs within the NHA. Sites designated as Globally Significant are of highest conservation concern within the Commonwealth.

All species tracked by PNHP documented at this NHA include:

Species or Natural Community Name		Global[1]	State[1]	PA Legal Status [1]	PABS Status[1]	Last Observed	Quality[2]
Sora (*Porzana carolina*)		G5	S3B,S3M	–	CR	2005	E
Tule Bluet (*Enallagma carunculatum*)		G5	S1S3	–	–	2007	BC
Sable Clubtail (*Gomphus rogersi*)		G4	S3	–	–	2007	BC
Baltimore Checkerspot (*Euphydryas phaeton*)		G4	S3	–	–	2010	E
West Virginia White (*Pieris virginiensis*)		G2G3	S2	–	–	2007	E
Sensitive Species of Concern A[3]	S	–	–	–	–	1997	E
Sensitive Species of Concern B[3]	S	–	–	–	–	1990	E
Sensitive Species of Concern C[3]	S	–	–	–	–	2007	E
Sensitive Species of Concern D[3]	S	–	–	–	–	2014	E
Sensitive Species of Concern E[3]	S	–	–	–	–	2018	B

[1] See the PNHP (http://www.naturalheritage.state.pa.us/rank.aspx) for an explanation of PNHP ranks and legal status. PABS status refers to the status recommended by the Pennsylvania Biological Survey.

[2] See NatureServe (http://www.natureserve.org/explorer/eorankguide.htm) for an explanation of quality ranks.

[3] This species is not named by request of the jurisdictional agency responsible for its protection.

Threats and Species Recommendations

The species of concern at this site can best be protected by preventing degradation of the forest here, maintaining open land as foraging habitat, and protecting water quality in the lake and the creeks that flow into it. Specific threats and stresses to the elements present at this site, as well as conservation actions, include:

- Degradation of water quality can have a negative impact on the habitat supporting the aquatic and wetland species of concern found at this location. The stormwater runoff from roadways, suburban development, and agriculture should be considered a potential source of significant contamination for the wetland habitat. Runoff from these sources has significantly higher levels of sediment, nutrients, pesticides, herbicides, and other pollutants than runoff filtered through a natural habitat. Maintaining a high quality aquatic habitat is important to the species of concern found at this location. Improve water quality and maintain the water quantity by protecting and enhancing existing aquatic habitats by monitoring water quality and enforcing protections. Best management practices (BMPs) that focus on limiting the introduction of non-point sources of pollution into surface and groundwater should be applied to the surrounding area, including creating buffers to protect wetlands and waterbodies from upland disturbances.
- Climate change may threaten the persistence of the sora and one of the sensitive species of concern, as they are known to be restricted to cooler habitats. A Climate Change Vulnerability Index (CCVI) analysis, which would evaluate this likelihood, has not been conducted. Minimize other threats to maximize these species' resiliency to climate change. To read a more detailed summary of this species' climate change related threats, visit the PNHP climate change assessment fact sheets page, http://www.naturalheritage.state.pa.us/climate.aspx.
- Aggressive non-native plant species are a potential threat to the wetland habitats used by marsh-breeding birds, especially species such as *Phragmites*, reed canary grass, or purple loosestrife. Left to spread, these species can crowd out native plant species, altering the habitat structure and resources available for the species of concern. Invasive wetland plants also threaten the Baltimore checkerspot, which uses the native turtlehead (*Chelone glabra*) as a host plant.
- Monitor for invasive plant species and remove them prior to becoming dominant at this site, if possible. Target pioneer populations of invasive plants for immediate and continued removal. It is much easier and more effective to keep a place invasive-free than to try to repair a heavily infested habitat. Invasive species management should be coordinated by individuals familiar with the rare species as well as the invasive species present. Continual invasive species monitoring and control will likely be necessary. For more information on common invasive plants in Pennsylvania, and management strategies, visit the invasive species page of the PA DCNR, linked in the references (Pennsylvania Department of Conservation and Natural Resources 2019).
- One of the sensitive species of concern depends on conifer stands. Conifer regeneration, however, is limited through deer browsing, invasive pests, and timber management practices. Reduction of deer populations to control overgrazing, or maintenance of low deer populations at this site, may be necessary to maintain site diversity. Uncommon species of native plants are particularly susceptible to deer herbivory. For a summary of deer management approaches, see the technical report developed by the Northeast Deer Technical Committee (Northeast Deer Technical Committee 2009). Additional resources are also available on the Pennsylvania Game Commission website. Monitor for invasive pests which target conifers at this site, and limit harvesting of mature conifers for timber.
- Over-browsing by white-tailed deer is in general a serious threat to overall plant diversity, and to species that rely on native plants. Baltimore checkerspots are threatened by deer overbrowsing because their host plant turtlehead (*Chelone glabra*) is a favored food of deer. Reduction of deer populations to control overgrazing, or maintenance of low deer populations at this site (Northeast Deer Technical Committee 2009), will benefit butterflies by increasing flowering plant diversity at the site.
- One of the sensitive species of concern is threatened by loss of conifer habitat nesting sites, as the result of management practices, succession, or disease. Consider planting dense stands of native conifers as nesting habitat. Protect remaining best available suitable conifer habitat.
- Conversion of forest to other land uses would be a potential threat to many of the species of concern here, but as state park land, the forest within this site is protected from most forms of development .
- One of the sensitive species of concern relies on intact, interior forest habitat with many large, old trees and standing snags for foraging and roosting. Fragmentation as a result of human developments, or logging, are threats to this species. Avoid the removal of large native trees with naturally exfoliating bark such as shagbark hickory, and allow snags or dying trees to persist upon the landscape as these provide suitable summer roost areas.
- One of the sensitive species of concern is at risk of collision with automobiles, buildings, power lines and towers, and other objects while foraging. Reduce vehicular traffic through agricultural lands to minimize collisions within the Core Habitat and the surrounding landscape.

We envision this NHA site account as one of the first steps for promoting conservation management actions to support the species of concern at the site. Many of these sites may have multiple habitat types present and require a mix of conservation strategies that may occasionally conflict. PNHP staff are available for additional consultation to help address specific site challenges. For additional information, please contact naturalheritage@paconserve.org.

Location

Municipalities: Indiana County: Cherryhill Township, Brush Valley Township

USGS quads: Brush Valley, Strongstown

Previous CNHI reference: This site does not overlap a previously published site.
Associated NHAs: This site is associated with the following other NHAs: Little Yellow Creek . We recommend consulting the accounts for those sites for additional conservation information.
Overlapping Protected Lands: Yellow Creek State Park
Approximate Acreage: 2715 acres

References

Northeast Deer Technical Committee (2009). *An evaluation of deer management options*. URL: https://www.pgc.pa.gov/Wildlife/WildlifeSpecies/White-tailedDeer/Documents/deermgmtoptions.pdf (visited on 01/30/2019).

Pennsylvania Department of Conservation and Natural Resources (2019). *Invasive Plants*. Pennsylvania Department of Conservation & Natural Resources. URL: https://www.dcnr.pa.gov:443/Conservation/WildPlants/InvasivePlants/Pages/default.aspx (visited on 01/31/2019).

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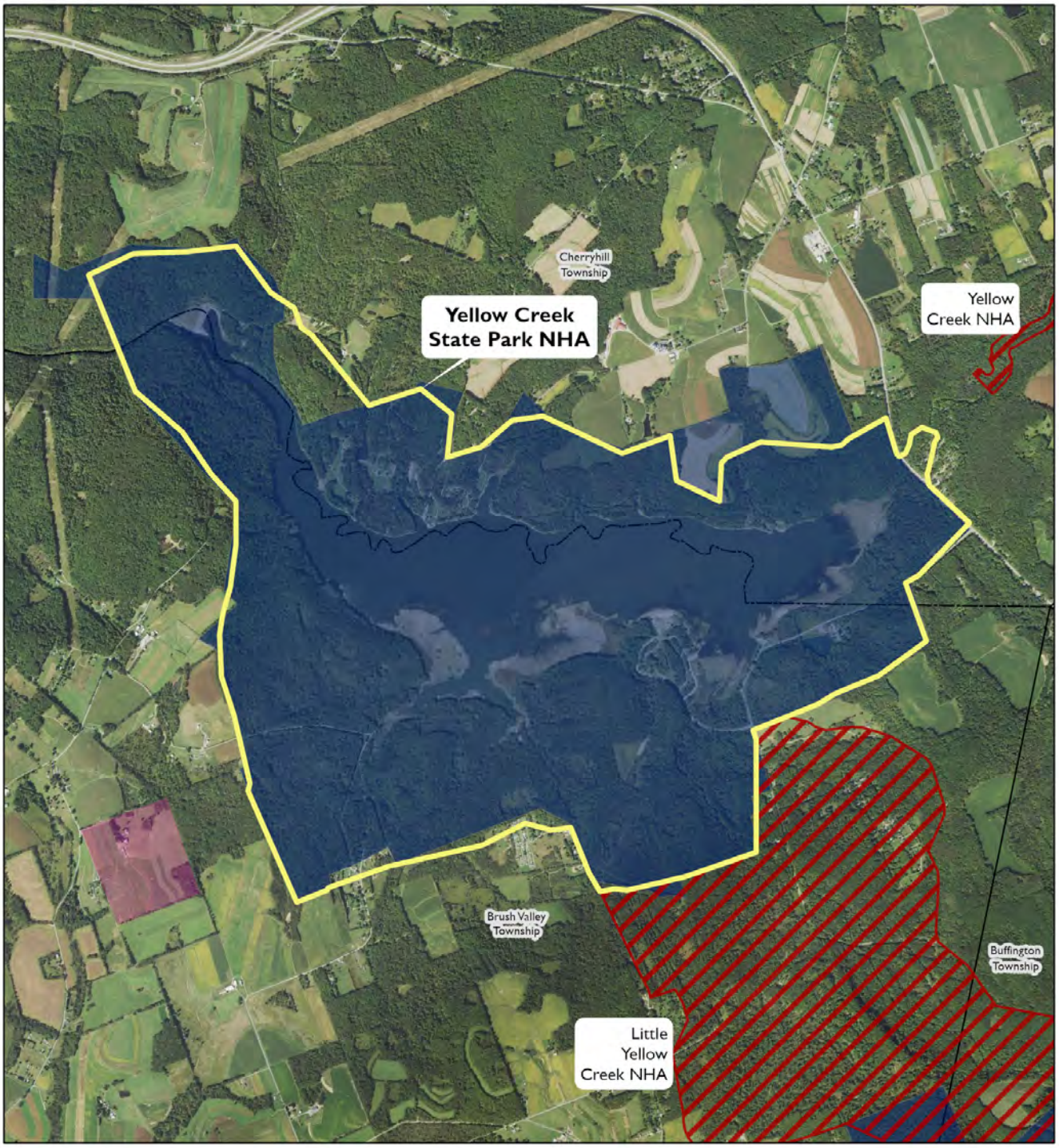
Cherryhill Township
Yellow Creek State Park NHA
Yellow Creek NHA
Brush Valley Township
Buffington Township
Little Yellow Creek NHA
0 0.25 0.5 1 Miles
0 0.3 0.6 1.2 Kilometers
N
PNHP
Pennsylvania Natural Heritage Program
NHA Core Habitat
Other NHAs
Protected Land
Conservation Easement