



# Pennsylvania Natural Heritage Program

information for the conservation of biodiversity

Wild Heritage News

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Photo Banner :  
Hardwood Trails  
Michael Knoop

## The Northeastern Terrestrial Habitat Classification System

by  
Jeffrey Wagner

As the Natural Heritage Program for Pennsylvania, we contribute to conservation efforts that involve counties, municipalities, and regions across the state. We work with agencies, conservation groups, and local governments to collect and interpret biodiversity information and make it as applicable as possible for the planning tasks at hand. Occasionally, we have the opportunity to step outside our normal boundaries and work across states with other Heritage programs and agencies. One such project has been The Northeastern Terrestrial Habitat Classification System (NETHCS) project. Begun in 2006, the project involved two phases – a classification phase, completed in 2008, and a mapping phase which has just recently been completed. PNHP staff served on advisory committees for the project and the program supplied data to assist in the modeling aspects of the project.

Habitat, both terrestrial and aquatic, is a key part of understanding how species are distributed and where they are likely to be found. Although the concept is

complex and involves factors of climate, vegetation, soils, and landform, we can distinguish habitats and species associated with those habitats, some much more specifically than others. Birds, like the grasshopper sparrow and eastern meadowlark, for instance, nest in large patches of grassland and really nowhere else. The green salamander, as another example, lives only in sandstone outcrops in the southern Allegheny Mountains of Pennsylvania.

We tend to know a lot about the habitat needs for a given species, but not as much about where that habitat occurs and how similar habitats relate. Being able to distinguish and classify habitats and then map them is essential to planning for conservation of species. Some states have their own habitat classifications and mapping – many do not. Without such a tool, it is difficult for states to consider how species exist within and move across the landscape. Additionally, because geopolitical boundaries mean nothing to plants and animals, the lack of understanding of region-wide habitat distribution makes planning across the range of a given

species exceptionally difficult. This was precisely the impetus for the development of a habitat classification for the Northeastern United States.

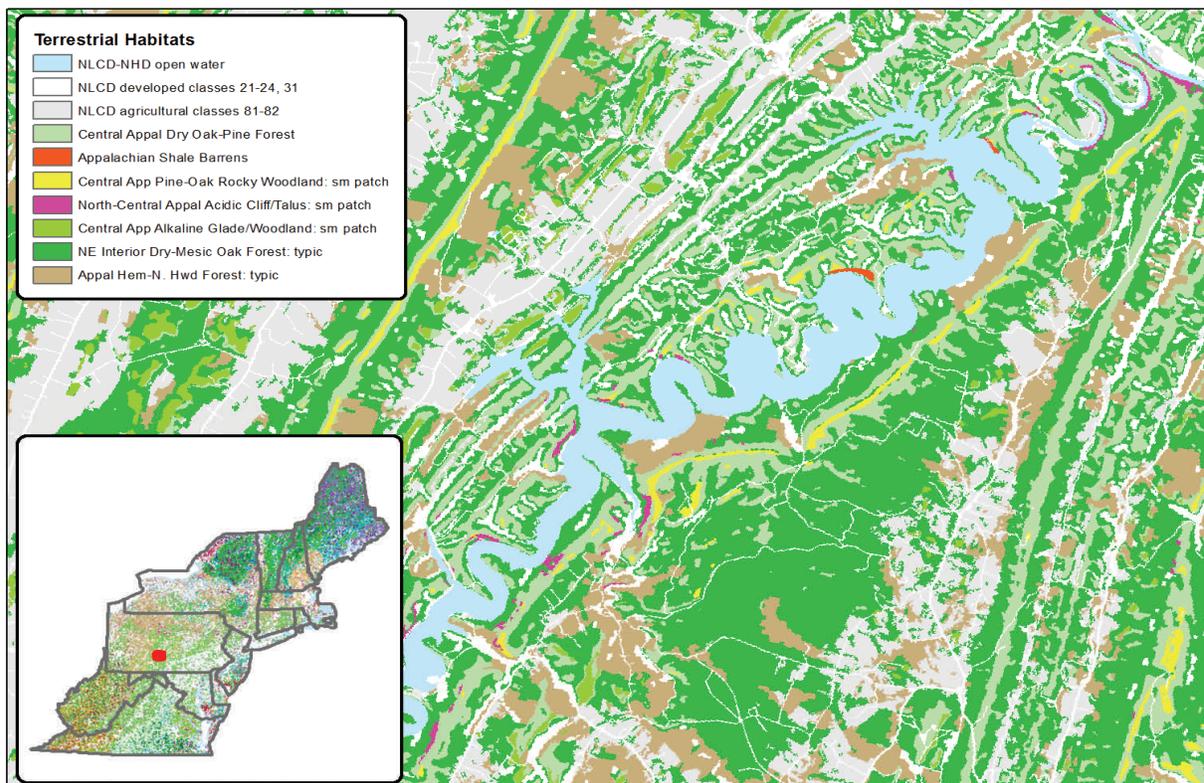
The Virginia Department of Game and Inland Fisheries, on behalf of NEAFWA (Northeast Association of Fish and Wildlife Agencies), successfully applied for support from the National Fish and Wildlife Foundation to put the project in motion. Through the principles of NatureServe and The Nature Conservancy, and the contribution of each of the thirteen northeastern states, the project was completed. It considered numerous factors and datasets, including NatureServe's Ecological System's Classification and the Landfire data for the United States (used to predict wild fire potential), that together determine the site capabilities and vegetation patterns of any given piece of the landscape.

A primary application of this project and its products will be for the State Wildlife Action Plans (SWAPs) for each of the states. The classification and mapping products provide tools that can give many of the goals of the SWAPs context and focus. Conservation and management can be more discretely focused at a regional level for specific species or groups of species. Also, concerns, particularly related to climate change,

can be better pictured and potential movement of species more explicitly understood.

The Conservation Opportunity Areas (COAs) project that PNHP completed at the end of last year did not have the benefit of the mapping component of the NETHCS. The COAs identified show the places where Species of Greatest Conservation Need (SGCN) are concentrated but within and among those areas, it is difficult to know exactly where to work. Fortunately, the habitat mapping just completed will provide a link between the broad scale of the COA project and the finer scale analysis and planning that will have to go on within each COA.

Each individual state within the Northeast will have to determine how to integrate the NETHCS into its SWAPs and conservation planning, in general. It will be important to think about the proper scale in which to use these new tools. Because this model extrapolates a mixture of data over a thirteen state area, planning and analysis at say the county level may work well but finer applications may work less well. Pennsylvania will have to consider how to best use this new data for the benefit of its native animal and plant species. PNHP will be closely involved in those discussions.



A sample section of the Northeast Habitat Map focusing on an area in southcentral Pennsylvania; a mosaic of habitats, including shale barrens and cliffs, are present in the area around Raystown Lake in Huntingdon County.

## It Takes All Kinds of Botanists: The Pennsylvania Rare Plant Forum

by

Steven P. Grund

*How many botanists does it take to change a light bulb?\** Far fewer than it takes to establish the conservation status of a plant species! Determining whether a species is common, rare, threatened, or endangered requires the collective experience of many observers. It also involves review of whatever historical information is available about the abundance of the species, information concerning the biology and ecology of the species, and a feeling for the magnitude of threats such as invasive species and habitat destruction. In Pennsylvania, this task is the legal responsibility of DCNR, but they rely heavily on recommendations from the Pennsylvania Biological Survey by way of the Vascular Plant Technical Committee (VPTC) and the Pennsylvania Rare Plant Forum.

In 1978, Paul Wiegman, then a botanist with the Pennsylvania Natural Heritage Program (known then as the Pennsylvania Natural Diversity Inventory), assembled a group of Pennsylvania botanists to draft a provisional list of plant species at risk within Pennsylvania. Interest in species that are rare within a state was not novel, but in the wake of passage of the United States Endangered Species Act of 1973, interest was forming to categorize the relative rarity of species pursuant to providing protection at the state level for the species at greatest risk. This group began to meet regularly to refine that list, and eventually became known as the Pennsylvania Rare Plant Forum.

Pennsylvania is fortunate to have an excellent contingent of gifted and seasoned botanists, but there is no single person with adequate field experience or time to assess the conservation status of all of the roughly 2100 plants native to Pennsylvania. Most states have technical committees consisting of 5-10 of the most prominent botanists in their state from academia and government who gather to make these decisions. Pennsylvania has such a technical committee (the VPTC), but there are many botanists outside of academia and government who have valuable knowledge that can supplement the resources of the VPTC, leading to more informed decisions. We have some extraordinary botanists who work as consultants to industry, or who spend much of their free time botanizing, and know particular regions of the state's flora extremely well. The Rare Plant Forum brings these

botanists together once a year to meet with professionals from universities, museums, conservation organizations, and state government. This broad array of backgrounds certainly improves the quality of the decisions made.

Decisions made at the Forum are reviewed by the VPTC before they become the recommendations of the Pennsylvania Biological Survey. Since the VPTC members also attend and participate in the Forum, there is rarely much need for discussion before approving the decisions made at the Forum, but those decisions have clearly benefited from the inclusion of the larger group.

The Rare Plant Forum is open to anyone who is interested in the conservation of the native flora of Pennsylvania. The forum meets at a different site every year, facilitating participation from botanists across the state. In addition to updating the conservation statuses of plant species, there are presentations related to plant conservation. Decisions are made using a consensus model, rather than by voting. Consensus, as used here, does not necessarily mean that everyone must agree to the same opinion, but rather that most people must agree, and those who disagree are willing to accept the opinion of the majority. Any person can block consensus if they disagree strongly with the majority opinion. If this happens, discussion continues until either a consensus is arrived at, or it is determined that consensus is not possible. In the rare cases of failure to reach consensus, the decision is referred to the VPTC. If you would like to receive invitations to the meetings and copies of the meeting minutes, email [sgrund@paconserve.org](mailto:sgrund@paconserve.org).

Methods of determining the appropriate conservation status of a species have evolved since 1978. Initially, a list of candidate species for conservation status was drafted based on the number of times the species had been documented in the past with museum specimens. Localities where the specimens had been collected were revisited to determine whether the species was still present. Other sites with similar habitats were surveyed to discover additional populations. This process continues, and the list is refined every year, but as more information has

become available, we have moved away from using rarity as the sole surrogate for endangerment, and have increasingly been considering trends, threats, resilience to the effects of human activities, and other relevant information. As a result, the list today is a more effective tool for focusing conservation efforts on the species that are truly at risk of disappearing from Pennsylvania, or even becoming extinct. The list grew for many years, as additional candidates were proposed based on field experience, but species were also removed from the list as fieldwork revealed that many apparently rare species were under-documented in the past, and there has been a steady reduction of listed species in recent years.

A few examples may serve to illustrate some of the factors that lead us to change the conservation statuses of species. Crepis rattlesnake root (*Prenanthes crepidinea*) was once thought to be globally rare. This plant blooms in the fall, but only a small portion of a population will bloom in any given year. In the spring, every plant produces a distinctive leaf, which withers in June on all plants but the few that will flower that year. Bonnie Isaac of the Carnegie Museum of Natural History conducted a study of the species and learned to search for the plant in the spring, eventually finding enough new stations to convince the Rare Plant Forum that the species should no longer be considered endangered in Pennsylvania.



Jim McCormac

Crepis rattlesnake root was removed from the list of Pennsylvania's plants of conservation concern after people learned to search for the distinctive spring leaves.

When volume 27 of the Flora of North America was published several years ago, we discovered that northern bog sedge (*Carex gynocrates*) was collected once in western Pennsylvania in the early 19<sup>th</sup> century. There was some debate regarding whether the species

had ever really been established in Pennsylvania, and the actual answer will likely never be known unless the species is re-discovered in the state. However, since the species is known from western New York, and for other reasons, the consensus was that it likely was once established as part of the flora of Pennsylvania, and has likely been extirpated from the state.



Rita Hawrot

Highbush cranberry has declined precipitously as a result of invasion by the viburnum leaf beetle. The Rare Plant Forum updated the status from Pennsylvania Rare to Pennsylvania Threatened in 2010.

Highbush cranberry (*Viburnum trilobum*) occurs in high-quality fens in Pennsylvania. Long considered to be Pennsylvania Rare, the Rare Plant Forum decided in 2010 to elevate its status to Pennsylvania Threatened due to a startling decline within all known populations as a result of invasion by the viburnum leaf beetle (*Pyrrhalta viburni*).

The Rare Plant Forum affords Pennsylvania with a unique system for the determination of the conservation status of plant species that draws on the experiences and perspectives of a broad array of people who have experience with the flora of the state. We hope that it may serve as a model for other regions.

Links to POSCIP and the Rare Plant Forum web site  
<http://www.naturalheritage.state.pa.us/Species.aspx>  
<http://www.paconserve.org/256/pennsylvania-rare-plant-forum>

*\*How many botanists does it take to change a light bulb?*  
 Four. Three to debate whether it is actually a bulb, a corm, or a tuber, and one to see to the task of fixing the light.

## Implementation Plans for Conservation Greenways

by  
Christopher Tracey

PNHP has been providing conservation information for land use planning through its County Natural Heritage Inventories (CNHIs) for nearly two decades. This data has been used for numerous projects including land protection, comprehensive plans, and greenway and open space planning. County greenway and open space plans, in particular, have used the sites identifying the habitat of rare, threatened, and endangered species as the backbone of many of the conservation corridors identified in the plan. Recently, PNHP ecologists and planners have moved beyond data provision to assist with the implementation of one of these plans.

The six-county “Southern Alleghenies Greenway and Open Space Plan,” completed in 2006, included biodiversity data from the Bedford County NHI (1998) and, at the time, the ongoing Fulton County NHI. Through discussions with the counties, it quickly became clear that while expertise and public inertia existed for many of the recreational (bike, hiking, or water trails) corridors, the same could not be said for the greenways designated for conservation. County planning staff in both counties were looking for additional assistance on how to transform a generalized line on the map into a greenway that supports biodiversity. This project helps to bridge the implementation gap in local planning by providing detailed biological guidance, Pennsylvania specific information, and expertise in land protection planning. This project will model how to utilize a broader greenways plan to establish a local conservation greenway that protects and manages land.

Working with the county planning commissions, we selected two pilot conservation greenway corridors, one in southeastern Bedford County oriented around a portion of Sideling Hill Creek and one in northeastern Fulton County oriented around Little Aughwick Creek. One of the first steps was to conduct a basic analysis of the greenway corridor. In this analysis, we inventoried the biodiversity elements, landcover, and other related data that was present in the corridor. For example, many of the conservation elements that were present in Little Aughwick Creek were associated with the stream, such as dragonflies and an endangered plant that lives in streamside seeps. Based on the habitat needs of the species present along the corridor, we developed

specifications for the corridor in terms of width and land cover. Although the southern headwaters of Little Aughwick Creek are largely forested and part of the Cowan’s Gap State Park or the Buchanan State Forest, much of the northern portion of the creek flows through an agricultural landscape. With this in mind we conducted a variety of analyses examining the amount of natural habitat along the riparian corridor. For the final product, we overlaid the parcels and identified various implementation options (e.g., easements, riparian restoration) for each parcel in the greenway.



Sideling Hill Creek, one of the greenway corridors studied.

Christopher Tracey

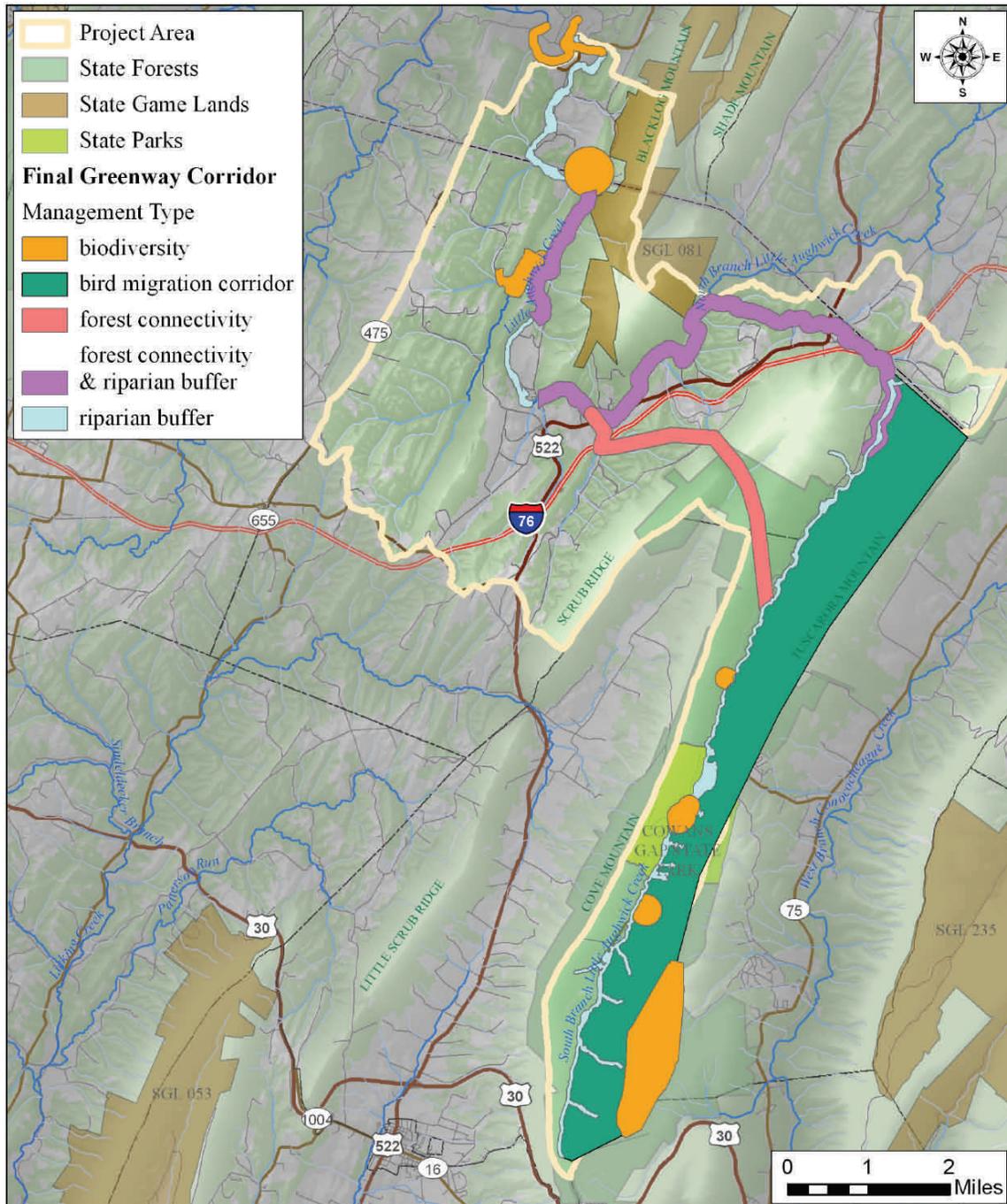
The primary audiences are county and municipal planners/supervisors, trail groups, and interested conservation groups in each county. The study will provide important insight into resources that are shared assets of the county and municipalities and allow local government to be more effective in their conservation efforts. Our work also built on the recommendations in the greenway plans, providing recommendations that are specific to the species present in the project corridors.

Land use planning, in general, is a critical need in many parts of rural Pennsylvania. Whether helping to site large-scale animal operations, energy development projects, or second home development, having land-use tools in place allows local communities to have a say in how their landscapes evolve. State agencies, like the Department of Community and Economic Development, rural development corporations, and non-profit entities

have a role to play in providing opportunities and encouraging local communities to seek out training, reach out to other communities around the state and region, and think five or ten years or more into their future.

Building on these results, we are beginning to conduct a similar analysis for Lehigh and Northampton counties in eastern Pennsylvania and plan to conduct additional studies in other areas of the commonwealth.

**Little Aughwick Creek Conservation Greenway Corridor**



One of the products of this study was a map of the greenway route with management goals for each segment of the corridor highlighted. This information will help to inform conservation efforts in the region.

## Notes from the Field

### County Inventory



Christopher Tracey

The Indiana County Natural Heritage Inventory represents a snapshot in time that highlights sensitive natural areas within the county.

We completed the Indiana County Natural Heritage Inventory (CNHI) and delivered the products to the Indiana County Planning Commission. Indiana County has 81 occurrences of species tracked by PNHP, including those listed as endangered, threatened, and rare species. It falls 52nd out of the commonwealth's 67 counties in this regard. The preparation of this report has resulted in the identification of 47 areas of conservation concern based on the habitat of these species of concern. Two of the highest priority areas for biodiversity conservation identified in Indiana County for this report are Strangford Cave, a limestone cave that is habitat for Allegheny woodrats and three cave dwelling invertebrate species of concern, and Little Mahoning Creek, a high-quality stream that provides habitat for numerous dragonflies, mussels, and other species of concern.

We completed draft reports for Butler, Cameron, Delaware, Jefferson, and Pike counties and made them available for review. Comments and suggestions from the respective Draft Review Committees are being incorporated into the final versions of the reports. Data entry and report writing continued for Erie County. The Indiana CNHI polygons were added to the CNHI Statewide Map web site and around 435 additional site descriptions for existing CNHI sites were reviewed for content, edited as necessary and formatted for consistency.

The Lehigh Valley CNHI Update project was started and entered its first season of field surveys. This update to the original Lehigh and Northampton CNHIs of 1999 will have two additional topics of focus in addition to the standard documentation of high priority areas for species of concern, 1) the impact of proposed transportation improvements on the most significant ecological resources and 2) a delineation, detailing and mapping of select greenway corridors to assist with further implementation and conservation of the Greenway effort within the two-county region.

### Zoology

We conducted freshwater mussel surveys within the West Branch of the Susquehanna and its major tributaries. The Lower Susquehanna Basin was also sampled this year, using qualitative and quantitative techniques that will allow us to make more accurate mussel population estimates. Sampling is ongoing for both basins and will continue through the summer.

We surveyed many promising and historic locations in the mountains of southwestern Pennsylvania this spring for mountain chorus frogs, but only one new population (on Chestnut Ridge) was documented.



Ryan Miller

Mountain chorus frog (*Pseudacris brachyphona*)

Three PNHP zoologists attended the 5th Hellbender Symposium in June. This meeting of researchers was held near Ligonier and focused on the plight and ongoing conservation efforts regarding the imperiled eastern hellbender.

Staff zoologists conducted northern water shrew surveys and mist netting for bats in many of the state forests of northcentral Pennsylvania; the northern water shrew may serve as an indicator species, since it depends on healthy streams with ample aquatic invertebrates. The shrew forages for prey along the bottom of these waterways, using specialized adaptations for diving such as its hind feet which are fringed with hairs. PNHP is collecting baseline information on this species because they are vulnerable to changes in water quality that may occur from global climate change and energy development.



Joe Wisgo

The northern water shrew was categorized as a “maintenance concern” species in the Pennsylvania Wildlife Action Plan, because of their limited distribution in the state and their reliance on forested clean headwater streams.

Other work on state forests has included odonate sampling in Moshannon State Forest and continued sampling of terrestrial invertebrates in Michaux and Sproul state forests. We also trapped for spotted turtles in a sandspring seep/vernal pool community in Michaux State Forest, with only one wood turtle encountered.

WPC malacologists met in June to conduct training for the upcoming summer’s sampling efforts in the Great Lakes region. PNHP will collaborate with multiple research agencies on a Great Lakes Restoration Initiative grant to sample the freshwater mussel populations of Lake Erie and some of its bays and tributaries.

Critical habitat for timber rattlesnakes, such as communal gestation areas where multiple gravid females congregate to bask before giving birth, are targeted for surveys by PNHP staff. Timber rattlesnake populations require expansive forested

areas, and habitat fragmentation creates risks to Pennsylvania’s timber rattlesnake populations.



Charlie Eichelberger

Monitoring timber rattlesnake “rookeries” allows PNHP partners to assess the health of timber rattlesnake populations in the heart of their range.

PNHP assisted staff from the Pennsylvania Game Commission (PGC) with falcon banding at a new nest site in eastern Pennsylvania. This is one of the only cliff nests in the state. Most other peregrine falcon nests are built on bridges or buildings, and the PGC is hopeful that the birds will continue to utilize more natural nest sites as the species continues to make strides in recovery.



Charlie Eichelberger

Charlie Eichelberger and peregrine falcon at nest site.



Cal Butchkoski PGC

## Botany/Ecology

The limestone flora inventory project began earlier this year with an expert botanist summit to classify Pennsylvania's plant species according to their pH preferences (acid, medium, or alkaline). Field assessments are now ongoing at limestone-influenced sites in the southwestern and central portions of the state. We are creating detailed lists of the flora, soil pH, community characterization, and site physical characteristics.



Jessica McPherson

Lindsey Bocian tests soil pH at Martin Mountain in Bedford County.

Field work to update older plant and animal records on Bureau of Forestry lands, primarily in the Marcellus Shale Region, began in earnest in the second quarter of 2011. PNHP botanists, ecologists, and zoologists targeted several areas within the Susquehannock, Loyalsock, Forbes, Cornplanter, and Delaware state forests. Several surveys targeting state or globally rare species were conducted in Michaux and Buchanan state forests as well. PHNP prioritized sites based on a number of factors including species rarity (rank), age of the occurrence (years since the occurrence was last seen), and degree of threat from development. Several known and historic occurrences of rare plants were revisited and many new populations of great spurred violet were observed. The work will continue in the third quarter of 2011 as well as the middle two quarters of 2012 with a focus on sites within the Marcellus Shale Region. The updated and new records will help the DCNR Bureau of Forestry protect critical habitat and resources for the species of conservation concern.

## Information Management

The Field Survey Geodatabase (FIND) is undergoing internal testing in preparation for its release to staff and partners. This geodatabase application includes a module for field data collection with a mobile GPS unit, as well as a platform for desktop data processing.

WPC zoology and data management staff are developing a database for aquatic invasive species in Lake Erie and surrounding watersheds in Pennsylvania, and Kierstin Carlson attended an Invasive Species symposium in Albany, NY in April. PNHP is preparing to participate in the iMAP Invasives initiative, and will be continuing to work with NY Heritage to use our data to implement the Pennsylvania node of the iMAP Invasives website. The iMAP Invasives website is an interactive mapping website that will centralize and display invasive species data for Pennsylvania.

Conservation Information Staff continue to process and update data and respond to internal and external data requests. We are in the process of documenting new data flow procedures to incorporate new tools such as FIND, and will be providing more information and training concurrent with the FIND rollout.



Great-spurred violet (*Viola Selkirkii*). Susquehannock State Forest, Potter County, Pennsylvania.

Ephraim Zimmerman

## Measures of Progress

The following Measures of Progress have been expanded and defined more precisely for 2011. We believe that these measures represent a significant cross-section of results of the work that we do as a program. These measures will be reviewed and updated, as needed, to best reflect the activities and goals of PNHP. Progress for these measures reflects seasonality of program activity.

Measure of Progress	Annual Goal (2011)	1st Quarter 2011	2nd Quarter 2011	Percent of Annual Goal
Biotics Records Updated	200	140	528	100%
New EOs Documented and Entered into Biotics	800	157	188	43%
New Records Entered into HGIS	300	116	144	87%
Percent of HGIS Records > 10 Years Old	50	53	51	N/A
Field Surveys Performed	400	0	354	88%
New CPPs Developed	1000	41	73	11%
Site Polygons Created and Attributed	400	0	47	12%
Management Plans/Guidelines Developed	30			10%
State Parks		0	3	
PA Game Commission		0	0	
Other		1	0	

PNHP performs many functions and provides many services as part of its mission. The measures of progress that are detailed here are meant to capture a number of important program activities and provide a picture of our progress in achieving our essential goals. The program goals and the measures provided for those goals will change over time as we complete certain aspects of our work and as new program responsibilities arise.

**Biotics Records Updated** indicates the amount of activity expended in improving and updating the more than 20,000 records in the PNDI database.

**New EOs Documented and Entered into Biotics** is a way to measure the success of our inventory effort in finding new occurrences of plants, animals, and exemplary natural communities. All new records entered into the database are counted.

**New Records Entered into HGIS** indicates our level of activity in reviewing, quality controlling, and entering records into the environmental review data layers. The timely and consistent refreshment of these data are critical to providing protection to the state's species of greatest concern.

**Percent of HGIS Records > 10 Years Old** is an indicator of the currency of data critical to the environmental review process. Keeping records as current as possible helps reduce the time needed to make decisions and determine a course of action for a given project under review.

**Field Surveys Performed** is a strong indicator of the effort expended on one of the basic functions of the program – inventory of the state's flora and fauna. Every field visit results in the entering of a field survey, regardless of the outcome of the survey.

**New Conservation Planning Polygons (CPPs) Developed** is a measure of our progress in creating ecological based mapping for the species and natural communities that we track as part of the PNDI database. Our goal is to have CPPs for all species and communities that we track.

**Site Polygons Created and Attributed** is a measure of our effort in developing, mapping, and describing sites that are important to conservation of Pennsylvania's biodiversity. This process began with County Natural Heritage Inventory projects and will now continue at a statewide level with the updating of existing sites and the creation of new sites. Site polygons will be based upon and consistent with CPPs.

**Management Plans/Guidelines Developed** is a direct indicator of our activity in utilizing our data and expertise to write management plans for a variety of clients and projects. We are increasingly called upon to provide this service and it will likely represent a substantial programmatic effort.