Pennsylvania Natural Heritage Program

information for the conservation of biodiversity

Wild Heritage News October—December 2012

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Long Pond at Presque Isle State Park is habitat for many rare species.

Photo Banner: Christopher Tracey

Erie County Natural Heritage Inventory Update

by

Christopher Tracey

PNHP recently completed the update to the Erie County Natural Heritage Inventory (CNHI)—the first systematic update to the document since 1993. As many things have changed in the nearly 20 years since this first inventory, this update will provide additional information and enhanced mapping to help guide conservation decisions.

Surveys for the updated Erie CNHI began in the spring of 2008, and took place on both public and private lands (the latter always with landowner permission). The field work immediately resulted in some notable discoveries. We focused the majority of the work on updating older records and visiting new sites not previously assessed through heritage surveys. Even visits to well-documented sites, such as Wattsburg Fen, yielded new discoveries of species tracked by PNHP, including several interesting invertebrate records.

Erie County has the highest number of rare, threatened, and endangered species of any county in Pennsylvania, with nearly 900 distinct populations present. Many of these are associated with unique habitats such as the Presque Isle sandspit and French Creek and are found nowhere else in the state. At least a third of these occurrences were new as documented in our recent inventory effort.

Through rigorous survey effort, PNHP staff visited as many potentially significant areas as possible in the two-year timeframe, but there is still much opportunity for exploration in Erie County. One of our favorite tasks during an NHI is to build

Pete Woods

Wild lupine (*Lupinus perennis*) is a rare plant found on many of the dunes at Presque Isle State Park.

Christopher Tracey

Coastal bluffs along the Lake Erie shoreline

partnerships with the local naturalist community to help supplement our field surveys. The Erie region is lucky to have a network of naturalists and scientists at local colleges and universities and non-profit organizations, as well as private citizens. Approximately half of the new Erie County records came from local naturalists. By cultivating these partnerships, we will continue to receive data in years to come as these naturalists explore Erie County. Much of the outside data we obtained came via the natural history collections at the Tom Ridge Environmental Center. Since this region is biologically rich, we believe that additional survey effort is likely to turn up new occurrences of plants, animals, and communities of concern.

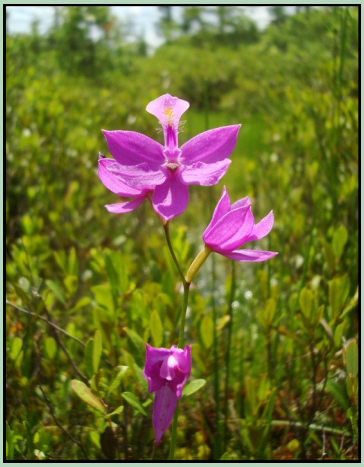
Pete Woods

Located in a glacial kettle, these waxy cap mushrooms are specialized to grow on sphagnum mosses.

Two of the most notable finds during this inventory include the northern redbelly dace (*Phoxinus eos*) and dwarf scouring rush (*Equisetum scirpoides*). The northern redbelly dace, a small fish, was thought to be extirpated in Pennsylvania, last documented in Meshoppen Creek in Tioga County in 1862. During fish surveys in 2008, it was discovered at several locations in the French and Brokenstraw creek basins. It is associated with spring-fed streams especially in back channels. Perhaps even more exciting was the discovery of a population of dwarf scouring rush which had not previously been documented in Pennsylvania. This species was growing in a small fen community outside of the town of Girard.

Titus Bog NHA

Titus Bog is arguably one of the most impressive glacial kettlehole bogs in Pennsylvania. Kettlehole bogs originate from glacial activity, when a block of ice calves from the front of the receding glacier and then becomes buried in sediment from glacial outwash. As the ice block melts, relatively deep, steep sided depressions are left in the landscape. If no streams enter or leave this kettlehole depression, they begin to fill with surface water from rain and snow (with some groundwater influence as well). Since these are closed systems, the water becomes acidic due to decomposing plant matter. Bogs are fragile environments, vulnerable to changes brought about through both natural occurrences and human interference



Christopher Tracey

Tuberous grasspink *(Calopogon tuberosus),* an orchid that grows at Titus Bog.

The process of succession formed the unique ecosystem that is found at Titus Bog today. Located in the center of the kettlehole basin is a floating mat of sphagnum-dominated peat which is surrounded by a shrubby moat. The peat mat likely formed through a series of expansions correlated with periods of drought over the past 800 years. This site is recognized as an outstanding scenic geologic feature by the Pennsylvania Geological Survey.

The bog provides habitat for several plants and insects of concern. Most of these species can be found on the floating bog mat. Overall, 153 species of plants have been documented on the site, including large cranberry, leather leaf, cottongrass, fragrant water lily, and sundews. Titus Bog has been recognized as a National Natural Landmark for the rare and unusual species among its rich floras.

Overall, 117 Natural Heritage Areas (NHAs) representing rare species and their habitats have been delineated. While there are 80 more sites than those that appeared in the original 1993 report, these sites are more precisely mapped and therefore the total area within NHAs is actually less than that from the 1993 inventory effort. Some of the more interesting sites include high lake bluffs that harbor a number of rare species along slumps and seeps. Further inland many wetlands ranging from swamps and marshes to fairly unique fens and bogs are found throughout the county. All of these features are the result of the region's glacial history and provide unique habitats for the rare, threatened, and endangered species of the county.

Pete Woods

A camouflaged crab spider lies in ambush on Joe-Pye-weed at Mercyhurst Fen.

This updated Erie CNHI represents a substantial revision to the longstanding style and format of the CNHIs, and will serve as a model for future county-by-county updates. Most of the sites from the first inventory are included as NHAs in the second inventory, but we have redrawn them to meet our new standards of identifying Core Habitat and Supporting Landscape. We designated numerous new NHAs around new finds, and some of the old NHAs were eliminated because the species for which they had been drawn were no longer present at the site.

Several large tracts of conservation land occur in Erie County. One of the most famous is Presque Isle State Park. While most people think of it as a recreation destination, it also harbors the highest density of rare, threatened, and endangered species of any similarly sized area in the commonwealth. Within Pennsylvania, many of these species are only found at Presque Isle and along the coast of Lake Erie. Other important pieces of protected land in Erie County include Titus Bog, Erie Bluffs State Park, Roderick Reserve (State Game Lands #314), and Lowville Fen Natural Area, which is managed by the Western Pennsylvania Conservancy.

Christopher Tracey

One of the most interesting habitats in Erie County are calcareous seeps that occur along steep, shale bluffs of Lake Erie tributaries.

Several land trusts including the Western Pennsylvania Conservancy, the Lake Erie Region Conservancy, and the French Creek Valley Conservancy are active in conservation projects in the area. The results of this project will help guide the future work of these land trusts in the identification of important properties. The Erie CNHI will also be used by county planners and decision makers to aid in planning by steering development away from sensitive areas.

Funding for the Erie County Natural Heritage Inventory update was provided by the Department of Conservation and Natural Resources, Pennsylvania Sea Grant, and the Erie Community Foundation.

Christopher Tracey

Howard Falls is the largest waterfall in Erie County.

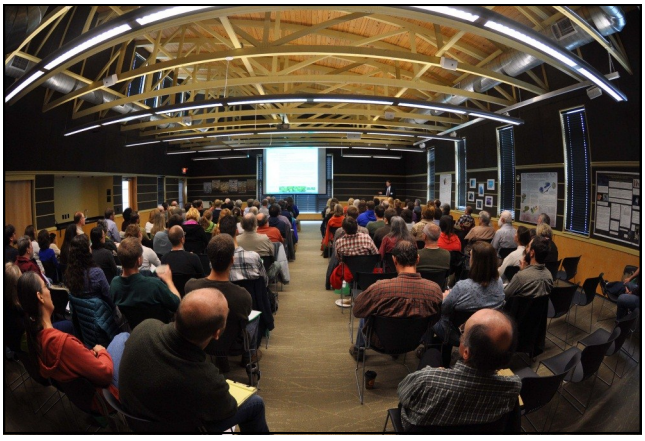
2012 Pennsylvania Botany Symposium

by

Scott Schuette

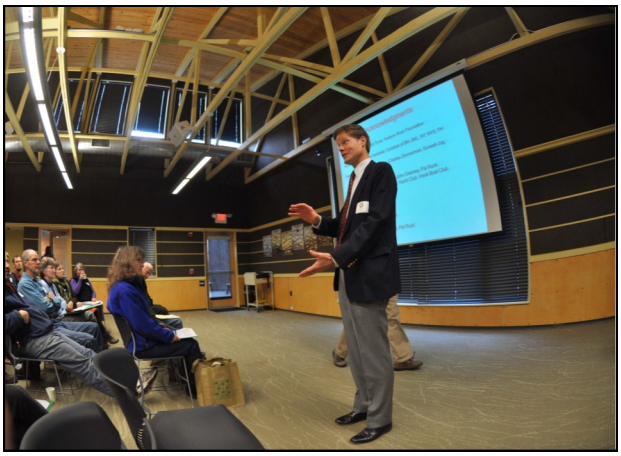
There is a long and rich history of botanical endeavors in Pennsylvania. William Bartram and his father John, both Pennsylvania born and raised, made botany their business. John was given the title of "Colonial Botanist to King George III" due to his collecting expeditions from North Carolina to Ontario that introduced New World plants to Europe. These endeavors led to collaboration with Peter Collinson in seed trade that popularized Kalmia, Rhododendron, and Magnolia overseas. His son William is most well-known for his travels in the southeast with John and the Lewis and Clark expedition. Both being friends of Benjamin Franklin they discovered and named *Franklinia alatamaha* (Franklin tree or Lost Camelia) after their dear friend. This plant is considered by some as America's first rare plant as it had completely disappeared from the wild in less than 40 years after its discovery.

The tremendous diversity of habitats in Pennsylvania has attracted people from the world over to explore the state's botanical resources. In fact, there was a botanical symposium held at Ohiopyle in July of 1905 that brought together botanists, bryologists, and mycologists for a week-long meeting. However, this meeting was part of an annual series that rotated locations throughout the northeastern United States and after 1905 there is no official record of any other botanical symposia in the state. To continue the legacy of botanical prowess in Pennsylvania and bring together botanists throughout the state, a consortium of botanists organized and hosted the inaugural Pennsylvania Botany Symposium at Carnegie Museum of Natural History's Powdermill Nature Reserve.



Scott Schuette

The seminar room was packed with symposium attendees from Pennsylvania and neighboring states.



Scott Schuette

Keynote speaker, Dr. Rob Naczi of the New York Botanical Garden, addresses the crowd with his updates on the revision of Gleason and Cronquist's Manual of Vascular Plants.

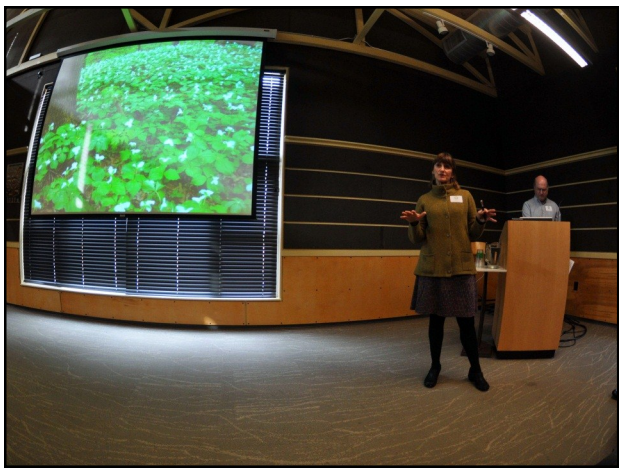
This two day biennial event kicked off on November 9th with nearly 75 people enjoying food, drink, music, and conversation at the Friday evening social. This gave folks the opportunity to catch up with old friends and make some new ones. The following morning registration opened at 7:00 a.m. and people from Pennsylvania, New York, West Virginia, and Ohio arrived for a breakfast before hearing the line-up of invited presenters. In total 117 people attended the first Pennsylvania Botany Symposium.

Rob Naczi, the Arthur J. Cronquist Curator of North American Botany at the New York Botanical Garden, delivered the keynote address. He summarized the progress being made on the revision of the *Gleason and Cronquist Manual of Vascular Plants in Northeastern United States and Adjacent Canada* and also highlighted some of the new features in this revision, such as etymologies, detailed geographic distributions, habitats, and conservation statuses on more than 5000 species. Rob also addressed the importance of field biology and the need for more field biologists to determine the extent of rare species abundances and distributions. Furthermore he stressed the crucial link between good current rare species data and conservation efforts.

Speakers delivered six other presentations that Saturday. James Lendemer, research scientist at the New York Botanical Garden, presented on the current understanding of lichen diversity in Pennsylvania. The impacts of non-native plant encroachment on wetlands

in the northwestern part of the state were profiled in a talk from Steve Grund, botanist with PNHP. A historical perspective on colonial American botany was delivered by Ernie Schuyler of the Academy of Natural Sciences in Philadelphia. A talk on the national trend of botanical capacity shortcomings from Andrea Kramer of the Chicago Botanic Garden and Botanic Gardens Conservation International highlighted the disturbing reality that is the lack of trained, qualified botanists in this country. Sue Kalisz of the University of Pittsburgh presented research on the effects of deer browse on native plants and how these activities facilitate invasion of non-native species in forests of Pennsylvania. Finally, Joe Isaac, botanist and project manager with Civil and Environmental Consultants, presented on significant botanical finds in the last ten years throughout the state. His presentation focused on the importance of a vibrant botanical community to locate and identify species new to the state as well as rediscovery of species once thought extirpated from Pennsylvania.

Following the presentations on Saturday, Scott Schuette bryologist and inventory coordinator for PNHP and Bryan Dolney of Pittsburgh Parks Conservancy led field trips to point out some of the bryophyte and lichen species at Powdermill. These trips were well-received by the participants of the symposium. Nearly 70 of the 117 people joined in for hour-long walks around the nature reserve.



Scott Schuette

Dr. Susan Kalisz of the University of Pittsburgh highlighting her research on the impacts of deer browse on native and non-native plants in Pennsylvania forests.

Scott Schuette

Pennsylvania Botany Symposium organizing committee (left to right) Lisa Smith, Steve Grund, Joe Isaac, Scott Schuette, Bonnie Isaac, Ephraim Zimmerman, Chris Firestone. Not pictured are Eric Burkhart and Tim Block.

Overall this first botanical symposium was a huge success. This is evidenced in some of the participant responses to a program evaluation (see below). The organizing committee, which is comprised of people from the Western Pennsylvania Conservancy, Carnegie Museum of Natural History, Pennsylvania Department of Conservation and Natural Resources, Penn State University, Morris Arboretum, Civil and Environmental Consultants, and E-Concepts Consulting, was very pleased with the turnout for this event. The symposium attracted more people than the allowed capacity at Powdermill Nature Reserve! The committee is now beginning to plan for the next Pennsylvania Botany Symposium to be held sometime in 2014.

Thank you for organizing. Looking forward to next time!

Great job!!

Enjoyed all the talks.

I thought that the variety of topics was great. It was also interesting to hear from people with such varying backgrounds. I thought the presentation by Andrea Kramer was very informative and inspiring.

Good mix of science, history and policy.

Trail Cameras Take Sneaky Snapshots for Mammal Surveys

by

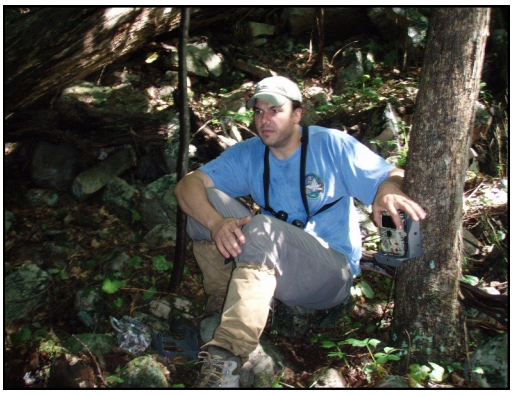
Ryan Miller

Recently PNHP has partnered with the Pennsylvania Game Commission to locate and update records of mammals. For this project we utilized remote trail cameras.

Trail cameras have been around for a while (since the days of film), however advances in technology have turned them into a unique undercover tool. These cameras are equipped with lightning fast motion censored triggers so the critters don't jump through the shot. Infrared flashes are undetectable by the animals, and illuminate the subject for its photo without scaring it off. The cameras are digital with up to 10 megapixels for ultra-clear pictures and are equipped with sensors that read temperature and barometric pressure. They even record the moon phase so biologists can detect animal movement patterns.

Just because these tools are high tech doesn't mean that getting these pictures is easy. The cameras were hung on trees (in bear proof metal boxes because sometimes bears can get curious) in areas of prime habitat (usually small openings in dense thickets of rhododendron, mountain laurel, and greenbrier on remote mountaintops). Sometimes baits like a stinky puree or greasy peanut butter suet were used to entice the animals in front of the camera.

While performing these surveys we captured thousands of images of many different creatures. The commonly photographed ones were raccoon, opossum, deer, and bear. More elusive were bobcats, rabbits, and coyotes. If we were lucky we captured images of Pennsylvania's rarer mammals like the endangered Allegheny woodrat.



All Photos by:
Greg Turner, PGC
Ryan Miller, PNHP

The Pennsylvania Rare Plant Forum

The 2013 meeting of the Pennsylvania Rare Plant Forum will be held at Shippensburg University on Saturday, April 13. The Rare Plant Forum is a function of the Vascular Plant Technical Committee of the Pennsylvania Biological Survey, and for over thirty years has served in an advisory role to the Commonwealth of Pennsylvania for issues related to the conservation of the native flora of Pennsylvania. In addition to discussing proposed changes to the list of Plants of Special Concern in Pennsylvania (POSCIP), there will be a few related presentations. This is an excellent opportunity to connect and work with other botanists, amateur and professional, who share your interest in the flora of Pennsylvania. All people interested in the conservation of Pennsylvania's native flora are encouraged to attend this meeting.

Pete Woods

Bunchflower

There can be no meeting of botanists without some botanizing! Prior to the meeting on Saturday, there will be an afternoon excursion on Friday afternoon to the Conodoguinet Creek floodplain along the Appalachian Trail, a favorite natural area in Cumberland County.

For more information on the meeting, including registration, please contact Ephraim Zimmerman, Chair, Pennsylvania Rare Plant Forum, phone: (412) 586-2319, ezimmerman@paconserve.org.

PNHP on the Move

Mary Walsh

Leopard frog

PNHP operates out of two main offices – one in Pittsburgh at WPC headquarters and one in Harrisburg which up until a few weeks ago was at a DCNR leased facility adjacent to the airport in Middletown. As of the second week in January, our staff will be situated in the Rachel Carson State Office Building along with the many DCNR staff we work closely with on a variety of projects. The move reduces overhead costs for DCNR, offers a better work environment, and provides staff with better access to DCNR resources and support.

PNHP staff will have access to lab facilities at the Department of Agriculture's Veterinary Labs, near the Pennsylvania Farm Show Complex. Also, DCNR and the State Museum are working on an MOU to allow PNHP staff to work with the Museum's collections and use their lab facilities. The Museum has also asked DCNR for assistance in reviewing the Museum's current natural history exhibits and to provide suggestions for new exhibits and "upgrades" for existing exhibits. The Museum would also welcome input from other state agencies as well as from PABS technical committees.

We are excited to take advantage of the opportunities offered with our new office and would like to thank everyone for their work and cooperation in helping to make the move as easy as possible. All of our email addresses will remain the same but our phone numbers and address have changed. Most importantly, our staff and service will remain the same as we finish the last of our unpacking and orientation. Come and visit us.

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Notes from the Field

Botany/Ecology

The Ohio State University

Different phases of euonymus scale on a Paxistima leaf.

Steve Grund and John Kunsman, PNHP botanists, submitted a report that completes a study of rare plants for the Wild Resource Conservation Program. This grant enabled a significant amount of our botanical work on priority species and occurrences driven by Natural Heritage methodology. This included work on Canby's mountain lover (*Paxistima canbyi*), a globally imperiled species that has been experiencing severe, but hopefully addressable, decline due to infestations of a non-native insect, the euonymus scale (*Unaspis euonymi*). Over the course of the grant timeline 90 field surveys were conducted resulting in 75 new and updated rare plant records. Of these 75 records, 52 species were listed as Endangered, Threatened, Rare, or Tentatively Undetermined in Pennsylvania.

Pete Woods and Christopher Tracey recently published a short botanical note about a dwarf scouring rush (*Equisetum scirpoides*), a plant species previously undocumented in Pennsylvania. During field work for the Erie County Natural Heritage Inventory a small population of this low, wiry plant was found within a fen, a rare type of wetland, on a parcel owned by Mercyhurst College. More information about the note can be found here: http://www.rhodorajournal.org/doi/abs/10.3119/12-16.

In the fourth quarter, Heritage and Game Commission staff finalized the concept of Conservation Management Units that will be used in site-specific management plans for the Pennsylvania Game Lands Management Tool. State Game Lands #51 was chosen as the second application of our model for management plans and was the first plan utilizing PGC's cover mapping. The draft plan was submitted to PGC and DCNR for review. Also, WPC worked with PGC to establish priorities for the creation of site-specific plans. This work plan is important for game lands requiring coordination among all agencies relative to PGC's current comprehensive planning efforts.

PNHP staff completed the analyses and final report for the Conservation Assessment of Calcareous Ecosystems project. The report summarizes two years of field surveys at calcareous habitats and reviews upland calcareous plant community types. It provides an assessment of the vascular plant taxa that depend on calcareous habitats, the remaining extent of these habitats in Pennsylvania, and the conservation significance of these habitats to vascular plant biodiversity in the state.

In August, the Ecology staff collected 643 square meter plots along the full length of both the Upper Delaware Scenic and Recreational River and the Delaware Water Gap National Recreational Area to document patterns in submerged aquatic vegetation (SAV) and associated environmental features. In the fourth quarter, the results of these surveys, including quantitative plot data and site notes, were compiled to create detailed descriptions of each SAV bed for the final report.

Betsy Leppo co-presented with Alex Pong of LaFayette College at the Lehigh Valley Watershed Conference on October 9, 2012. The presentation title was "Vernal pools: How to recognize, respect, manage, protect, restore, and create them, with a special note on climate change vulnerability." Betsy also presented on vernal pool conservation and management at the Entomological Society of Pennsylvania's annual meeting in October.

Betsy Leppo

A high quality vernal pool in Pike County

Conservation Planning

Conservation Planning staff have been upgrading the geodatabase of Natural Heritage Areas, coinciding with the new WPC server upgrade. Revisions were made to NHA data fields to expand the type of information contained within the dataset, including the addition of overlapping protected lands, municipalities, USGS quadrangles, and associated NHAs. The new geodatabase also has new creator/editor tracking with the ability to automatically record the date on which any NHA is modified and who made the modification. These features will improve our ability to track NHA updates.

Natural Heritage Area significance ranks have often been determined via different methods depending on where sites are located in the state. We developed a new significance ranking system in which each NHA is assigned a significance rank that represents the site's *biodiversity importance*. Ranks are calculated by a numerical score representing the Global Ranks and Subnational Ranks of each species or natural community present at the site, weighted by element occurrence Quality Ranks. Scores are summed for each site to produce an overall NHA site score, which guides the categorical ranking of NHAs by expert review. Site scores are assigned one of four categorical ranks of Global, Regional, State, or Local significance based on score thresholds and criteria defined by PNHP biologists. The new significance ranks enable objective assessments of biodiversity importance at each NHA relative to all sites statewide and provides a single standardized system.

Data Management

The Field Information Networked Database (FIND) is in use by WPC Heritage staff, and currently contains information for a total of 697 field surveys. During this quarter, the server and geodatabase were upgraded to ArcGIS Version 10.1. An overview of FIND and improvements scheduled for the new version (FIND 2.0) were presented at the PNHP All-Staff Meeting in November. An abstract for presenting FIND at the Northeast Regional Natural Heritage Conference, to be held in Baltimore in April 2013, was submitted and has been accepted. FIND 2.0 is in progress and undergoing testing, and is expected to be deployed early in 2013. Training sessions for WPC Heritage staff have been scheduled for late January 2013. All data collected beginning with the first records entered into the database will be available to DCNR and PNHP partners.

Zoology

Kathy Gipe, PFBC contract herpetologist, is participating with twelve states in the northeast and mid-Atlantic on a project to develop a monitoring framework that evaluates the current status and quantifies population trends of the wood turtle, *Glyptemys insculpta*. A long term monitoring site for wood turtles was established in Centre County and three surveys were conducted along the 3-km length stream study site. Three wood turtles were found. Surveys will resume in the spring. Additionally, volunteer recruitment is underway across the state to establish rapid assessment survey sites throughout the range of the wood turtle in the commonwealth.

Kathy Gipe

Wood turtle shell

Dave Lieb is currently serving on the advisory committee for the Northeast Regional Conservation Needs (RCN) project entitled "Conservation Assessment of Odonata (Dragonflies and Damselflies) in the Northeastern Region" which will assess the distribution and conservation status of the odonate fauna (dragonflies and damselflies) of the northeastern United States and augment Pennsylvania's efforts to assess the state's odonate fauna.

Betsy Leppo

Eastern least clubtail (Stylogomphus albistylus)

New Funding

Four PNHP staff members received new funding from the Wild Resources Conservation Program.

Scott Schuette

Pogonatum pensylvanicum and Cephaloziella rubella are common early successional bryophyte species that establish on exposed soil and tolerate heavy disturbance.

Scott Schuette, inventory west coordinator, developed a project to determine potential bryophyte and lichen indicators of forest integrity in Tiadaghton State Forest. Species and environmental data collected from forests that are under selective timber management, shale gas development, and undisturbed conditions will be analyzed to compare the impacts of these disturbances on the bryophyte and lichen communities.

Mary Walsh, aquatic ecologist, received a grant to support a SWG-funded project assessing the distribution, populations, host fish availability, genetic structure, and habitats for the eastern pearlshell mussel. This project will survey for previously unrecorded populations of eastern pearlshell in potential habitats, assess densities with standardized methods at existing locations, and compare water quality and habitat at existing locations and former habitat to prioritize restoration efforts. Our research partner, Dr. Curt Elderkin at The College of New Jersey is studying the genetic viability and isolation of eastern pearlshell in Pennsylvania to identify source populations for augmentation efforts.

Mary Walsh

Eastern pearlshell mussel

Mary Ann Furedi, monitoring coordinator, received funding to initiate long-term monitoring of northeastern bulrush (*Scirpus ancistrochaetus*) populations in Pennsylvania. The project builds on existing low-intensity monitoring efforts that update population data every five years. The new funding will allow for more rigorous monitoring efforts that include collection of environmental data at five sites to better understand the species habitat requirements.

Ephraim Zimmerman

Great-spurred violet

Adam Hnatkovich, special projects coordinator, is funded to assess plant community structure around known populations of great-spurred violet (*Viola selkirkii*) on state game lands and state forests. Information gathered from this project will be used to improve the mapping of ecologically important habitat and develop appropriate management strategies for great-spurred violet, and to assess its utility as an indicator of rich hardwood forest communities.

Measures of Progress

The following Measures of Progress 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 (2012)	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Cumulative Total	Percent of Annual
Biotics Records Updated	200	127	127	96	78	428	100% +
New EOs Documented	800	169	198	88	82	537	67%
New Records Entered into HGIS	300	96	169	88	81	434	100%+
Field Surveys Reported	500	32	130	135	253	550	100%+
New CPPs Developed	3000	1037	3792	821	813	6463	100%+
NHAs Updated	120	29	52	113	121	315	100%+
Outreach to Local Government	20	2	1	1	2	6	30%

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 is a way to measure the success of our inventory effort in finding new occurrences of elements of ecological concern (plants, animals, and exemplary natural communities). Biotics records are created for each new Element Occurrence documented.

New Records Entered into HGIS indicates our level of activity in reviewing, quality controlling, and entering biotics 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.

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.

NHAs Updated is a measure of our effort in developing, mapping, and describing sites (Natural Heritage Areas - NHAs) 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.

Outreach to Local Government is a measure of our initiative to increase interaction with local government and reflects our commitment to seeing our information used and refined to meet the needs of planning efforts within the counties and municipalities of the commonwealth.