



Pennsylvania Natural Heritage Program

information for the conservation of biodiversity

Wild Heritage News

July-September 2014



Berks County Natural Heritage Inventory Update

by

Rocky Gleason and Jeff Wagner

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Photo Banner:
Rocky Gleason

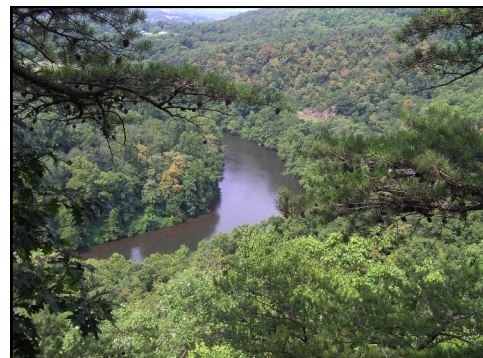
Looking towards Reiffton
from Schwarzwald Hill in
Berks County

The Berks County Natural Heritage Inventory (CNHI) Update was completed this year after a 2 ½ year effort. Sitting at the interface between the Valley and Ridge and the Great Valley physiographic provinces of Pennsylvania, Berks County also sits at the edge of influence from the Philadelphia metro area. While still maintaining a largely rural character, the county faces challenges in preserving farmland, open space, and natural habitats that define that character. Since the original inventory in 1991 the county has seen substantial growth, but numerous Natural Heritage Areas mapped in the original inventory are still intact and we also recognized several new ones. Overall, we documented 73 Natural Heritage Areas representing 85 species and natural communities of conservation importance for the county.

While much of the funding for this project as well as for other CNHI projects has been provided by the Pennsylvania Department of Conservation and Natural Resources, a generous grant from the Wyomissing Foundation contributed to the Berks CNHI effort. As for all CNHIs,

we work closely with the county to ensure that the information we collect and present will be of use to planning and land use decisions. Glenn Knoblauch and Cheryl Auchenbach of the Berks County Planning Commission were key in helping us make contacts and organize advisory committee meetings.

Even though the essential use and purpose of the CNHI projects has not changed, the number of people involved and the breadth of the products have. In the early days, one primary biologist would be responsible for almost every step in the process. Currently, while a primary biologist leads most of the survey effort,



Rocky Gleason

The Schuylkill River from Neversink Mountain

we have up to a dozen people involved in both the field work and the development of products.

Our ecologists select survey sites for all of our CNHIs based on two primary factors: those areas where species of concern have been documented in the past and are in need of updated information; and identifying areas on the landscape, based on aerial photo inspection, that suggest suitable habitat exists for species of concern. Information on species of concern locations has come from a myriad of sources over many years. Early naturalists from 100 to 200 years ago documented many significant species for the region and museums host their voucher specimens, which typically include very vague location information. In the later part of the last century new information poured in through a renewed interest in natural history that was in many ways spearheaded in the southeastern part of the state by the efforts of Morris Arboretum botanists Ann Rhoads and Timothy Block, and many other local naturalists in recent years including Susan Munch, Jack Holt, Janet Ebert, Rick Mellon, Mike Slater, Steve Johnson, Ken Lebo, Karl Gardner, Tony Schoch, and Larry Lloyd, Senior Ecologist with the Berks Conservancy to name just a few.



Denise Watts, PNHP lead ecologist on the Berks CNHI update, photographs lion's-foot at Chrome Serpentine Barrens.

Rocky Gleason



Susan Munch assessing mosses on outcrops along Saucony Creek.

Rocky Gleason

In Berks County, Heritage Program botanists, zoologists and ecologists conducted numerous surveys both to update previously documented species of concern and to look for new occurrences in previously under-surveyed locations, sometimes as part of another project that happened to overlap with the Berks CNHI project. Private property owners were contacted for permission to access their property for biological surveys, initially through the mail, due to the large volume of property owners we needed to contact in this heavily populated region of the state. Many of these landowners desired follow-up calls, or in some cases, personal visits to secure permission to survey their properties.



Scott Bearer, The Nature Conservancy

Several surveys for cave adapted crustaceans were conducted by PNHP staff in Berks County during the project.

We now use a Field Inventory Networked Database (FIND) to enter field data including location, habitat description, population size and extent, and current and potential threats to the population and its habitat. Our Information Management staff processes this data and enters it into our Biotics

database (the standardized database developed by NatureServe for managing Heritage Program data) and the PNDI data system. Our planning team uses the data to construct Conservation Planning Polygons (CPPs) which define the area of importance for the species or natural community we've documented. These CPPs are used to create and map the Natural Heritage Areas that are the central focus of the CNHI projects.

We compiled the various site descriptions, associated polygons, maps, and introductory text into a report that was provided to the Berks County Planning Commission and to DCNR for uploading to its website, the Pennsylvania Natural Heritage Program (PNHP) Interactive Map, where all of the current CNHI sites and their associated descriptions can be viewed.

As you can see, there are many people involved in various aspects of these CNHI projects. But among the

most important are the many private landowners that allowed our biological survey staff onto their property. Without their support, this project would merely be an inventory of publicly accessible lands of the county, a far less complete picture of the regional biological resources.

Highlights among the numerous species of concern updated or newly documented in the county include the following:



Northeastern bulrush

Christopher Tracey

A population of northeastern bulrush (*Scirpus ancistrochaetus*) was documented in the county. This species is listed as Endangered by the U.S. Fish and Wildlife Service. Pennsylvania is a stronghold for the northeastern bulrush and this Berks County record represents a previously unknown county for this species.

An Indiana bat (*Myotis sodalis*) maternity colony was verified in the county, and surveys focused on locating the foraging habitat for the bats. This species is also listed as Endangered by the U.S. Fish and Wildlife Service.



Eastern pearlshell mussel

Mary Walsh

Eastern pearlshell mussels (*Margaritifera margaritifera*) were documented in a Berks County stream. This species of mussel is at the southern limit of its range in

Pennsylvania and this Berks County record represents the southernmost known population in Pennsylvania. Individuals of this species have been documented to live over 100 years and may be one of the longest living invertebrate species.

The flypoison borer moth (*Papaipema* sp. 1) is currently only known to occur in Pennsylvania and was documented along the Kittatinny Ridge on the northern boundary of Berks County.

Larva of this species feed on the roots of the flypoison plant (*Amianthium muscaetoxicum*).



Flypoison borer moth

Betsy Leppo

Butterfly pea (*Clitoria mariana*) is a plant in the legume family that is near the northern limit of its known range in Pennsylvania and the Berks County location is the only known extant site in the state for this species.

A cave invertebrate, Price's cave isopod (*Caecidotea pricei*), currently known to occur in only fifteen locations scattered in Pennsylvania, Virginia, Maryland, and West Virginia, was confirmed still living in Host Cave.



Price's Cave isopod

Charlie Eichelberger

Bog bluegrass (*Poa paludigena*) is a delicate, slender grass associated with spring fed headwater streams in Pennsylvania. It can be found scattered across the northeastern part of the U.S. from the Great Lakes to the mid-Atlantic, but is considered globally vulnerable throughout its range.



Bog bluegrass

John Kunsman

Pennsylvania Crayfish Fauna Finally Getting Some Attention

by

David A. Lieb

The year was 1906 and Arnold E. Ortmann, Curator of Invertebrate Zoology, Carnegie Museum, had just published his groundbreaking monograph on the crayfishes of Pennsylvania. Little did Ortmann know that almost 100 years would pass before another systematic survey of Pennsylvania's crayfish fauna would be undertaken. During that time, much would change across Pennsylvania but the impacts of these changes on the state's crayfish fauna would remain unknown. Until recently, simple questions about the species in the state could not be answered. Have the ranges of the state's native crayfishes changed since the early 1900s? Have exotic crayfishes invaded Pennsylvania? Are there any rare or threatened crayfish within the state? Fast forward to the present and the efforts of a team of scientists have begun to provide answers to these questions and others.



D.H. Funk

Spinycheek crayfish (*Orconectes limosus*), native to eastern Pennsylvania

From 2004 to 2010, Ray Bouchard (Academy of Natural Sciences of Philadelphia) and I along with colleagues conducted crayfish surveys in the eastern half of Pennsylvania which showed that non-native (exotic) crayfish have invaded much of the region with devastating impacts on native crayfishes. Entire drainage basins that once supported only native crayfishes have been overrun by exotics. For example, the range of the spinycheek crayfish (*Orconectes limosus*), which is native to eastern Pennsylvania, has declined (retreated eastward) by approximately 140 miles and the species has nearly been eliminated from the Susquehanna and Potomac drainages of Pennsylvania. Within these drainages, the once wide-ranging

spinycheek crayfish is now restricted to several small sub-basins where it is afforded protection from the invasive onslaught by barriers (dams), which have prevented the upstream migration of exotic crayfish into those sub-basins.



K. Kelly

Densities of exotic rusty crayfish are often extremely high in invaded systems such as the Susquehanna River in Pennsylvania pictured above.

Unfortunately, the impact of exotic crayfish on invaded systems does not stop there. At densities that sometimes exceed 18 individuals per square foot (compared to less than one individual per square foot for most native crayfishes); exotic crayfish literally consume everything in sight in some systems - aquatic plants, other invertebrates, amphibians and their egg masses, and anything else they can get their claws on. Additionally, although native crayfish are an important food item for many fish species, their exotic counterparts are often too big (especially their claws) and aggressive to be eaten by most fish. Exotic crayfish also consume fish eggs and can have strong negative effects on fish reproduction. The end result



D. Lieb and P. Mooney

A five-gallon bucket filled with exotic crayfish collected from Marsh Creek in south-central Pennsylvania.

for affected fish populations is often less food, fewer offspring, and reduced abundance and biomass, which, if you are an angler, means there are fewer fish to catch and those that are present are smaller.

This work has helped inform agencies and other researchers about the status of native and invasive crayfish in Pennsylvania. The Pennsylvania Fish and Boat Commission passed regulations in May of 2014 to limit the spread of invasive crayfish used for bait; the regulations will become law on January 1, 2015. It is hoped that these regulations will slow the spread of exotic crayfishes in Pennsylvania and protect the state's uninvaded waters.

Although thousands of exotic crayfishes were collected during surveys of eastern Pennsylvania, an unusual crayfish species was also collected from four small drainages in the southeastern part of the state. The crayfish, which may be endemic to Pennsylvania, appears to be morphologically unique and likely represents a species that is new to science. Unfortunately, during follow-up surveys to better define its range, exotic crayfish were collected from three of the four drainages where the species occurs. It is hoped that stricter regulations will help keep the fourth drainage free of exotic crayfish.



Burrowing crayfish chimney

Peter Woods

Elsewhere, efforts have begun to resurvey western Pennsylvania for crayfishes. The western part of the state is home to three species of burrowing crayfishes (a fourth species of burrowing crayfish occurs in eastern Pennsylvania). Burrowing

crayfish often occur in the vicinity of springs, seeps, ditches, small streams, and other wet areas where they dig burrows through moist soils to reach the underlying ground water. During the digging/excavation process, burrowing crayfishes pile mud and dirt outside of their burrows. The mud/dirt piles, referred to as chimneys,



Zachary Loughman

Extraction of a blue crayfish (*Cambarus monongalensis*) from a burrow near a roadside ditch in southwestern Pennsylvania.

are often the most visible sign that a burrowing crayfish colony occurs at a site. Crayfish burrows can be several feet deep and quite complex, consisting of multiple entrances and tunnels. Crayfish generally reside in their burrows year-round, coming out periodically to forage (often on moist, rainy nights). Some species of burrowing crayfish can be found in surface waters during parts of the year, although they do not reside there year-round.

Burrowing crayfish are important components of the ecosystems in which they reside. For example, burrowing crayfish provide critical habitat for the eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*) and Kirtland's snake (*Clonophis kirtlandii*); both species are Pennsylvania endangered and both hibernate in crayfish burrows. Additionally, crayfish burrows provide critical habitat for endangered odonates (dragonflies and damselflies) and other invertebrates, especially during the summer when surface waters dry up.



Eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*)

Peter Woods



Zachary Loughman

Blue crayfish (*Cambarus monongalensis*), a burrowing species native to western Pennsylvania

To get a handle on the distribution and status of this very important group, PNHP staff along with Zach Loughman (West Liberty University) have begun to survey western Pennsylvania for burrowing crayfishes. To date, 31 historical sites, last surveyed by Ortmann in the early 1900s, have been revisited. These efforts have resulted in the collection of the blue crayfish (*Cambarus monongalensis*) from a number of sites where it historically occurred. The little brown mudbug (*Cambarus thomai*) was collected from some historical sites but not others. Future efforts will attempt to determine why *Cambarus thomai* is now absent or extremely rare at some historical sites.



Zachary Loughman

Little brown mudbug (*Cambarus thomai*), a burrowing species native to western Pennsylvania

In addition, the digger crayfish (*Fallicambarus fodiens*) was discovered for the first time in Pennsylvania by Loughman. The digger crayfish is known from northeastern Ohio and it was suspected that the species could occur in northwest Pennsylvania. Loughman sampled a site in Crawford County in northwest Pennsylvania, based on a tip from PNHP botanist Steve Grund who photographed some crayfish chimneys that he found while looking for rare plants. After considerable effort, Loughman was able to extract a digger crayfish from its burrow and our suspicions



Zachary Loughman

First collection of the digger crayfish (*Fallicambarus fodiens*) in Pennsylvania.

were confirmed. The known burrowing crayfish fauna of Pennsylvania had expanded for the first time in over 100 years (from four species to five).

Next year, the remainder of the historical sites in western Pennsylvania, as well as those in the eastern part of the state will be visited. These efforts will include visits to sites that historically supported upland burrowing crayfish (*Cambarus dubius*) and devil crawfish (*Cambarus diogenes*), as well as additional historical blue crayfish and little brown mudbug sites. The final phase of the project will include surveys of areas that have never before been surveyed for burrowing crayfishes but which are suspected to support burrowers based on the presence of suitable habitat or accounts by fellow scientists and amateur naturalists. Sightings of burrowing crayfishes or crayfish chimneys/burrows can be reported via email to Dave Lieb (c-dlieb@pa.gov) and will be very helpful in our quest to determine the distribution and status of Pennsylvania's burrowing crayfishes, one of the state's most interesting and understudied groups of animals.

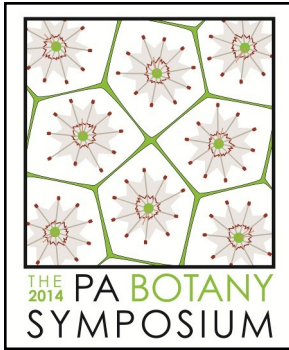


Zachary Loughman

Upland burrowing crayfish (*Cambarus dubius*), a burrowing species native to western Pennsylvania.

Notes from the Field

2014 Pennsylvania Botany Symposium



The 2nd biennial meeting for academic, professional, and amateur botanists to share current research in the region is upon us. This year the symposium will be held at The Penn Stater Conference Center Hotel in State College on November 7 and 8. The Pennsylvania Botany Symposium steering committee

is proud to be offering three concurrent workshops on Friday, November 7 from 1:30 to 4:30 p.m. The workshops are "Introduction to Grasses, Sedges, and Rushes," "Demystifying Pennsylvania's Violets," and "Making Sense of the Ovals, the Most Difficult Sedges in the Pennsylvania Flora." Following the workshops, there will be a social highlighted by a presentation from Dr. Chris Martine of Bucknell University entitled "Dummy Pollen, Buzzing Bees, and the Glossy Age of Botany." On Saturday, November 8 there is an exciting lineup of presenters that will be talking about various topics in botany. For a complete list of speakers with summaries of their presentations and information on how to register please visit <http://pabotany.org/2014-symposium-abstracts/>.

Assessment of Riparian Vegetation

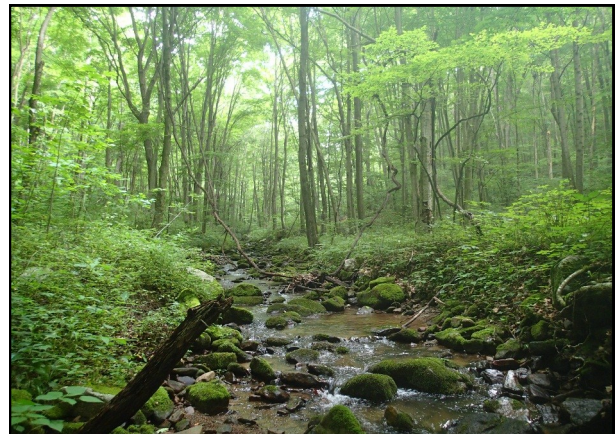
During the 2014 field season, PNHP ecologists continued to assess the patterns of riparian vegetation of higher order streams in selected watersheds across



Project staff documenting riparian vegetation and soil characteristics.

Mary Ann Furedi

Pennsylvania. In the past, much of the riparian vegetation work done by PNHP ecologists and botanists focused on plant communities associated with larger river systems like the Delaware and Allegheny rivers. This current EPA-funded project, which began in late 2012, provides an opportunity to expand our understanding of riparian associates by examining the plants found along the banks of smaller, headwater streams in Pennsylvania.



Mary Ann Furedi

Headwater streams are the smallest parts of river and stream networks, but make up the majority of river miles in the United States. They are the part of rivers furthest from the river's endpoint or confluence with another stream. Many headwater streams have been lost or altered due to human activities such as urbanization and agriculture, and this can impact species and water quality downstream.

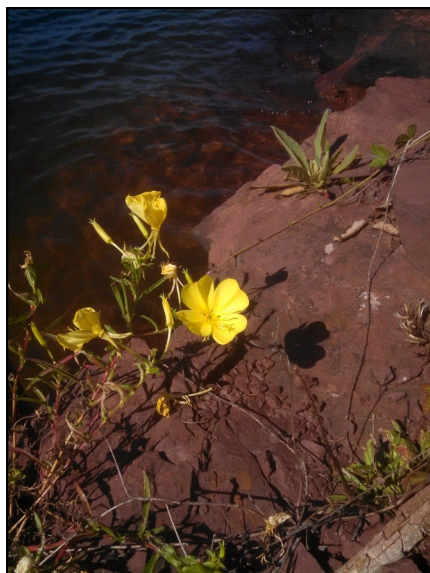
This summer's assessment work focused on headwater streams in three areas of the state, the Allegheny National Forest, Ohiopyle State Park, and French Creek State Park. We assessed 21 streams between late June and early August and have assessed a total of 47 streams in six focal areas of the state, thus far. PNHP staff will visit additional streams in 2015 so that most regions of the state are represented in the dataset.

We selected high quality, first and second order streams in each area using a combination of aerial imagery and multiple GIS layers. Staff then visited the selected streams and walked either a stream reach or the entire stream to examine the patterns of vegetation occurring streamside. We established temporary transects across the banks of representative portions of the stream and recorded all vegetation occurring along the transect, as well as additional stream and site characteristics.

This information will be used to define characteristic plant communities found along headwater streams, and to examine similarities and differences between riparian plant communities within and across specific regions of the state. Results from this project will provide reference information that the Pennsylvania Department of Environmental Protection (DEP) can incorporate in their mitigation strategies for headwater streams. The data will also be helpful in the further expansion of PNHP's plant community classification of riparian areas.

Rare Plants at Raystown Lake Shale Barrens

When the Raystown Lake Dam was constructed in the early 1970s, a lot of shale barren habitat along the Raystown Branch of the Juniata River was submerged, destroying unique habitat for many plants and animals, some of which are of conservation concern. Steep slopes and cliffs are created when meandering streams erode bedrock. When the bedrock is shale, and the resulting steep, exposed rock faces at least somewhat southward, the intense sunlight and heat create harsh, desert-like conditions that we refer to as shale barrens. The Raystown Branch hosts many of Pennsylvania's shale barrens.



Scott Schuette

Rare plants are not always the showiest species, but the shale barren evening-primrose (*Oenothera argillicola*) is a real beauty.

many of those that can are not good at competing in more lush conditions. The result is a habitat with low site diversity, but high conservation value because many of the species are rare.

The steepness of these barrens prevents the accumulation of soils deep enough to support more than scattered tree growth, but herbaceous plants occupy crevices and small ledges where pockets of soil collect. A limited number of plant species can tolerate those conditions, but



Steve Grund

A close relative of the red clover that is commonly grown for hay, Kate's mountain clover (*Trifolium virginicum*) is a low plant that produces thick, tuberous roots that anchor the plant into precarious crevices and store water, which is in short supply in the harsh conditions on shale barrens.

The good news is that although much of the shale barren habitat at Raystown Lake was lost with the creation of the lake, the upper portions of the barrens are mostly intact. PNHP biologists Scott Schuette and Steve Grund surveyed some of the remaining shale barrens this summer and found most of the known remaining populations of rare plants to be doing well, and also discovered several new stations.

Rare Plant Discovery

In August, PNHP staff were mapping invasive species along the bluffs of Lake Erie, when they spotted a previously undocumented population of the Pennsylvania endangered grass-of-parnassus (*Parnassia glauca*) on a seep above their heads. Scrambling up to get a better look, they also found a patch of small plants that turned out to be marsh arrowgrass (*Triglochin palustris*). Within Pennsylvania, this species had previously been found only on Presque Isle, and it hadn't been seen there since 1927. The plant is very small (the flowers are only 2 mm wide) and is easily overlooked, but nothing else that grows in the region resembles it.



Peter Woods

Marsh arrowgrass (*Triglochin palustris*)

Pennsylvania iMapInvasives Homepage

In March 2013 Pennsylvania became one of eight other states/provinces to begin utilizing the iMapInvasives database, a tool used to track invasive species. In an effort to raise awareness of the database and attract an active user base, PNHP staff with Pennsylvania iMapInvasives provided several presentations for groups interested in learning about this online tool. We are currently developing a Pennsylvania homepage that will be dedicated to state-specific invasive species information, issues, current events, and resources. When completed, Pennsylvania will join five other states that have iMapInvasives homepages.

The following is a short list of highlights that will be featured on the Pennsylvania iMapInvasives site:

- **Gallery of Invaders** – Inspired by the book “Pennsylvania’s Field Guide to Aquatic Invasive Species” produced by Pennsylvania Sea Grant and The Pennsylvania State University, this gallery will feature all of the aquatic invasive species found in the AIS field guide along with accompanying information including photographs, identification tips, species habitat, and distribution information.
- **Invasive Here But Not There** – Did you know that some species found in Pennsylvania are both native and invasive to our state? This page provides a list of species that fall under this category and also provides a map that indicates the counties where the species is known to be native and where it is found to be invasive.

Invasive Here But Not There

Species Range

Native Invasive

Alewife (*Alosa pseudoharengus*)


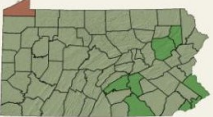


Photo credit: Shaan Good, Vermont Department of Fish and Wildlife, Bugwood.org



Broadleaf water-milfoil (*Myriophyllum heterophyllum*)





Photo credit: Leslie J. Mehroff, University of Connecticut, Bugwood.org



Flathead catfish (*Pylodictis olivaris*)





Photo credit: Eric Engbretson, U.S. Fish and Wildlife Service, Bugwood.org









- **Be on the Lookout** – Certain high priority invasive species are not known to be found in Pennsylvania (yet), but have been located in surrounding states. This page highlights a few of those species to “be on the lookout” for, in case they make their way into Pennsylvania.

Be on the Lookout for New Invaders!

Invasive species are constantly on the move and are entering new areas all the time. As part of the Early Detection and Rapid Response effort, it's important to keep an eye out for new invasive species that are not known to occur in Pennsylvania but do occur in neighboring states in order to stop or slow their spread if they enter our state.

IF YOU FIND ANY OF THESE NEW INVADERS IN PENNSYLVANIA, BE SURE TO REPORT YOUR OBSERVATIONS TO PA IMAPINVASIVES IMMEDIATELY SO YOUR FINDINGS CAN BE DIRECTED TO THE APPROPRIATE OFFICIALS.

<p>Silver Carp <i>Hypophthalmichthys molitrix</i></p> 	<p>Bighead Carp <i>Hypophthalmichthys nobilis</i></p> 
<p>Black Carp <i>Mylopharyngodon piceus</i></p> 	<p>Asian Longhorned Beetle (ALB) <i>Anoplophora glabripennis</i></p> 
<p>Red Shiner <i>Cyprinella lutrensis</i></p> 	<p>Chinese Mitten Crab <i>Eriocheir sinensis</i></p> 

- **iMapInvasives Training Video** – If you are new to iMapInvasives or simply need a refresher on how to use the database, this page provides access to the observation data entry training video (also available on YouTube) as well as a link to an associated quiz on information presented in the video. Users who watch this video and pass the quiz will be able to increase their user levels and enter observation data.
- **Invasive Species in the News!** – This page will feature news articles, press releases, and other information highlighting recent occurrences where invasive species were the main event.

The Pennsylvania iMapInvasives homepage will be hosted on the PNHP website and is expected to launch before the end of this year. If you have ideas for additions to the Pennsylvania iMapInvasives homepage once it's been launched, please contact imapinvasives@paconserve.org. Your comments and feedback are encouraged.

Forest Breeding Bird Surveys



David Yeany

The song of the black-throated green warbler (*Setophaga virens*) is commonly heard in core forests of the Northeastern U.S. and Appalachia during the summer, but its breeding densities are much lower where disturbance has caused loss of forest canopy and near habitat edges.

During May through July 2014, PNHP staff continued surveys for forest breeding birds as part of shale gas development assessments and baseline monitoring. Ornithologist David Yeany and Avian Field Technician Katrina Johnston conducted nearly 890 avian point count surveys across 25 sites of high ecological value throughout the Marcellus shale region of Pennsylvania. The goal of these surveys is to establish baselines for breeding bird densities and diversity within specific forests to enable monitoring of impacts from habitat disturbance due to shale gas activities.

This was the second year that we surveyed these sites, and we recorded 102 bird species and more than 17,000 detections of individual birds over the two years. We are especially interested in monitoring impacts to the 35 Forest Interior-Dwelling Species



David Yeany

Wood Thrushes (*Hylocichla mustelina*) nest in the forest understory throughout eastern North America, but are more successful breeders in large, unfragmented forest patches.

(FIDS) of birds we found during these surveys. FIDS are an assemblage of bird species that breed most successfully in large tracts of contiguous, mature forest. Eight of the ten most abundant species that we recorded were FIDS and included birds like red-eyed vireo, ovenbird, wood thrush, and black-throated blue warbler. Others were birds of conservation concern, such as cerulean warbler, Kentucky warbler, and Blackburnian warbler.



David Yeany

Accumulation of forest disturbances, such as logging, deer browse, and invasives will lower the quality of interior forest and can negatively impact breeding forest interior birds.



David Yeany

High quality interior forest habitat offers diverse layers of vegetation structure in large, unfragmented blocks.

With any type of development or disturbance activity in heavily forested habitat, we see not only a direct loss of natural habitat, but also a fragmentation of habitat patches as new edges and young, regenerating vegetation are created. Two groups of more common bird species tend to benefit from these habitat alterations – Early Successional and Edge Habitat assemblages – while these changes negatively impact FIDS. We also recorded 23 of these species that adapt to disturbance, and birds like eastern towhee, common yellowthroat, indigo bunting, and blue jay were among the most abundant. We will use the results of these surveys and our continued bird monitoring efforts to

evaluate areas of high conservation value for changes in breeding bird abundance, bird species composition, and habitat condition with continuing shale gas development in Pennsylvania.

Bat Research

Zoologists Charlie Eichelberger, Joe Wisgo, and Ryan Miller aided the Pennsylvania Game Commission with bat research in eastern Pennsylvania in July and August. This work consisted of maintenance of bat boxes, installation of new bat boxes, and mist netting and banding little brown bats and the Federally Endangered Indiana bat. Little brown bat and Indiana bat populations have seen a 98% decline over the past six years due to white-nose syndrome.

The focus of this work was to locate and band individuals at their summer roosting and maternity colonies and hopefully re-encounter the banded individuals hibernating in caves during winter surveys. This will give federal and state agencies much needed information on bat migrations and habits post white-nose syndrome decline and could lead to better protection of the individuals that have survived.

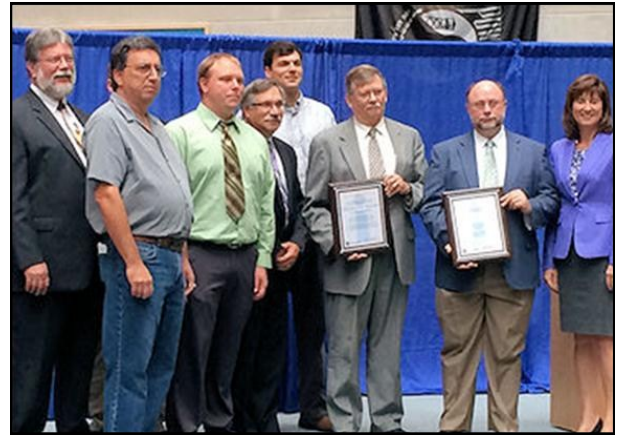


Ryan Miller

This Indiana bat was captured in a mist net and banded with a high visibility wing band so that it can be easily identified if encountered during hibernation counts during the winter.

Governor's Innovation Award

Western Pennsylvania Conservancy (WPC) Heritage staff Charlie Eichelberger, Joe Wisgo, John Kunsman, and Rocky Gleason, DCNR Natural Heritage Section Chief Greg Podniesinski, as well as staff from the Pennsylvania Historical and Museum Commission (PHMC) were awarded a Governor's Innovator Award on July 22. The award recognized a collaboration that provides support for the State Museum's collections while providing PNHP scientists access to state of the



Award ceremony participants include, from left, David Dunn, State Museum Director; Walt Meshaka, State Museum Curator; Joseph Wisgo, Assistant Zoologist, PNHP/WPC; Joseph Deklinski, Director, Government Innovation Office; Charlie Eichelberger, Zoologist, PNHP/WPC; James Vaughn, Pennsylvania Historical and Museum Commission Director; Gregory Podniesinski, DCNR Natural Heritage Section Chief; and Kelly Logan, Secretary of Administration.

art lab facilities for the preparation and preservation of plant and animal specimens.

PHMC currently has only one curator for all plant and animal collections at the Museum and had to "mothball" the small mammal and botany collections. At the same time, WPC PNHP staff were in need of a lab space in downtown Harrisburg to prepare specimens and also a repository for those specimens. As a result of this collaboration, WPC PNHP scientists have completely reorganized the botany collection, including updating specimen labels, checking specimen identifications, and repairing specimen cabinets. Both the small mammal and botany collections are now functional and ready to accept material from PNHP and other researchers. In the near future, DCNR and PNHP staff will be working with PHMC to update existing displays (the displays have remained unchanged since the 1970s) and to develop ideas for new displays. A conservative estimate of savings to DCNR and PHMC is \$50,000 annually.

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 (2014)	1st Quarter	2nd Quarter	3rd Quarter	Cumulative Total	Percent of Annual Goal
Biotics Records Updated	300	213	158	90	461	154%
New EOs Documented	800	166	170	162	498	62%
New Records Entered into HGIS	350	72	71	71	214	61%
Field Surveys Reported	500	4	46	63	113	23%
New CPPs Developed	400	160	597	229	986	247%
NHAs Updated	120	0	73	31	104	87%
Outreach to Local Government	20	4	4	7	15	75%

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.