Pennsylvania Natural Heritage Program

information for the conservation of biodiversity

Wild Heritage News April-June 2012

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Pitch pine woodlands occur on steep ridgetop slopes at Kings Gap State Park and may provide habitat for species of concern, such as barrens moths.

Photo Banner: Stephanie Seymour

2012 Bioblitz at Kings Gap

by

Ephraim Zimmerman

On June 2 and 3, PNHP and DCNR coordinated a BioBlitz at Kings Gap Environmental Education Center situated on South Mountain in Cumberland County. The BioBlitz, which is a popular term for an effort to document as many living things as possible in one place in one 24-hour period, was an opportunity for PNHP and state parks staff to work together with the public and experts from across the state on a comprehensive inventory of Kings Gap. Over 80 people participated in the BioBlitz including professionals from several state agencies, non-profits, museums, universities, and clubs, such as the Carnegie Museum of Natural History, Duquesne University, Dickinson College, York College, Shippensburg University, Messiah College, New York Botanical Garden, Pennsylvania Biological Survey, DCNR, DEP, Eastern Penn Mushroomers, Trout Unlimited, and The Nature Conservancy.

Chris Tracey

Bioblitz leaders organized taxa groups before heading out to survey areas of the park.

The BioBlitz effort documented 748 species within the dry oak and pine forests on the rocky ridgetops, deep stream ravines, and vernal ponds on the property.

Botanists documented 241 plant species at Kings Gap typical of the natural communities of South Mountain. Of these, 66 species are introduced. One highlight of the event was PNHP botanist John Kunsman's discovery of a new population of shining panic grass (*Dichanthelium lucidum*), which represents a range extension by two counties inland of what is primarily a coastal plain species. Botanists also found many interesting species that have apparently become locally established from old gardens near the park office and mansion, the former Cameron family residence. Many of these species had not been previously documented in the county.

Non-vascular plant experts recorded 60 species of mosses and liverworts, collectively

referred to as bryophytes. The shaded moist conditions of the hemlock/hardwood forests of Kings Gap Hollow Run and Irishtown Gap Hollow Run provide ideal growing conditions for many bryophyte species.

A team of lichen experts from the New York Botanical Garden recorded 64 species, including a species never before documented in Pennsylvania and several noteworthy and uncommon species that in Pennsylvania indicate high quality habitat.

The Eastern Penn Mushroomers provided expertise for the fungi taxa at the BioBlitz and noted the unexpected diversity of species recorded at a time of year when fungi are usually sparse. Of note were two species of chanterelles that generally do not appear before mid-July.

Chris Tracey

The Eastern Penn Mushroomers identified 58 species of mushrooms.

A team from the Carnegie Museum of Natural History found 4 slugs and 19 land snails. The total number of species observed suggests the property is intact and relatively high quality compared to more urban areas. Despite the acidic nature of the South Mountain bedrock, the team noted several species found in limestone habitats. These species were limited to the parking area for the Ridge Overlook Trail, possibly because of the imported limestone gravel.

The insect team documented a total of 222 insect species in both terrestrial and aquatic habitats. Despite the low diversity, the surveyors recorded four uncommon dragonflies and damselflies as well as two uncommon and showy moths, the huckleberry sphinx and the apple sphinx. The team observed that the greatest richness of aquatic invertebrates came from a lower reach of Kings Gap Hollow Run downstream of where it crosses beneath the entrance road.

JoAnn Albert

The insect team installed blacklight traps along the Scenic Vista Trail.

It is difficult to document mammal diversity in a 24 hour period, and the mammal team's efforts only resulted in nine species. Bats were observed at the BioBlitz; however, biologists were unable to capture them in mist nets set up near the ponds. Mammal experts reported that while a few surveys cannot give an overall trend for bat populations, the lack of bats captured at the BioBlitz echoes much of what is being seen in eastern North America – that this region's bat species have all seriously declined from White Nose Syndrome.

The bird team recorded 40 bird species throughout the park. The property is predominately inhabited by forest species, such as scarlet tanager, wood thrush, hooded warbler, and ovenbird, which are found primarily in interior forest. The large forested areas at Kings Gap are critical to many species in the highly fragmented landscape of Cumberland County.

The herpetological survey team found 15 amphibian species and 11 reptile species. The most diverse location was the vernal pond area where the team documented all three of Pennsylvania's ambystomatid salamanders (spotted, Jefferson, and marbled), four frog species, red spotted newts, and snapping turtles. Irishtown Gap Hollow Run, Kings Gap Hollow Run, and other waterbodies are also important areas for salamanders, frogs, toads, and turtles. The upland forest and outcrop habitat is important for several reptile species.

BioBlitz fish teams surveyed both Irishtown Gap Hollow Run and Kings Gap Hollow Run. Neither stream is stocked, but the team observed both the native brook trout and non-native brown trout, suggesting that both streams contain naturally reproducing populations of these two species.

BioBlitzes are useful mechanisms for obtaining a snapshot of the biological diversity of a site. However, many participants pointed out that a one-day survey is insufficient for documenting the entire biological diversity of the site. The effort did, however, play a valuable role in bringing professional field biologists, managers, and the public together in a comprehensive field inventory effort. While the Kings Gap BioBlitz may have concluded, the inventory effort is not over. PNHP will compile these results, along with the findings from other studies that have been conducted recently at the property, in a report to guide conservation planning and management activities at the park.

New Database Uses Latest Technology, Improves Efficiency

by

Tyson Johnston

After several years of research, design, and development, Heritage staff members now have a powerful new tool at their fingertips – it's called "FIND" and it lives in the "Cloud." FIND, or the Field Information Networked Database, is the latest product of Heritage data management staff. It is being used to capture and store field observation data. Armed with a GPS-enabled mobile device and a web-connected computer, users can easily collect, edit, and share data with other authorized users anywhere.

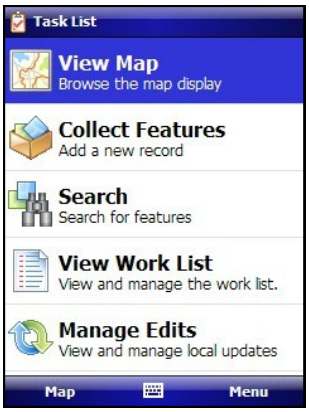
The development and release of FIND streamlines data submission, processing, and archiving for Heritage staff across the commonwealth. While records for occurrences of species of concern and natural communities were added to our element tracking database, BIOTICS, there was not a unified place or location to store general field survey data that did not contain any tracked elements. Despite advanced organization, searching for survey data often required looking in multiple databases, manual file repositories, and sometimes, different office locations. In 2009 Heritage staff began building the initial version of FIND to address the needs of the Heritage program.

In building FIND, the major technological obstacle that we had to overcome was program-wide access to a centralized database. Members of the Heritage program work for different agencies and organizations on different computer networks in different locations which, until recently, made hosting such a database difficult. To overcome this barrier, we are employing cloud computing technology.

What is the "Cloud"?

The "Cloud" is often used as a metaphor for the Internet. Cloud computing is essentially the use of an off-site server to store and process data which can be accessed remotely. By hosting FIND on the Cloud we realize two main benefits. First, authorized users can access FIND anywhere they can use the internet. Second, we do not need to purchase and maintain dedicated server hardware to host FIND. Contracting with a Cloud computing vendor provides us with scalable, up-to-date hardware tailored to our needs. If at any time we need more storage, processing power or other resources, we can easily modify "our" server with a few clicks of a mouse.

How FIND works



FIND is a versioned geodatabase hosted on the Amazon Elastic Compute Cloud (Amazon EC2). Users can currently access FIND through either a Mobile or Desktop application. FIND-Mobile users are equipped with touchscreen GPS devices running ArcGIS Mobile 10 on Windows Mobile. The ArcGIS Mobile software provides users with an intuitive interface to view maps (we currently provide users with state-wide topographic maps) in FIND to collect new data. A typical FIND-Mobile workflow involves the user first downloading data onto the mobile device for the area to be surveyed, collecting new field data, and later uploading or "posting" edits to the Cloud server, thus backing up the data.

After field data collection is complete, Heritage staff use FIND on their desktop computers. As in FIND-Mobile, the first step is to download the data for the geographic area in which the user has been working. The user can then view, create, and modify data as necessary using ArcGIS 10. Unlike FIND-Mobile, which has a limited number of data entry fields to complete, the desktop version provides users with a full view of the attribute tables to best describe their observations. Users can even add attachments to their record, ranging from a

Tyson Johnston

voucher photo or scanned, hand-drawn sketch to a sound or video clip! When editing is complete, users upload or "synchronize" their edits with the Cloud server.

In both FIND-Mobile and Desktop, as soon as the upload process is complete, the data is live on the Cloud server. This means that other users can see new data nearly as fast as it is being created! A "Data Status" field, which accompanies each record in FIND, allows users to know whether a record is currently still in draft form or has been completed. Records identified as "Ready for Data Management," are accessed by data management and processed accordingly. Once processed, the record remains in FIND for future reference.

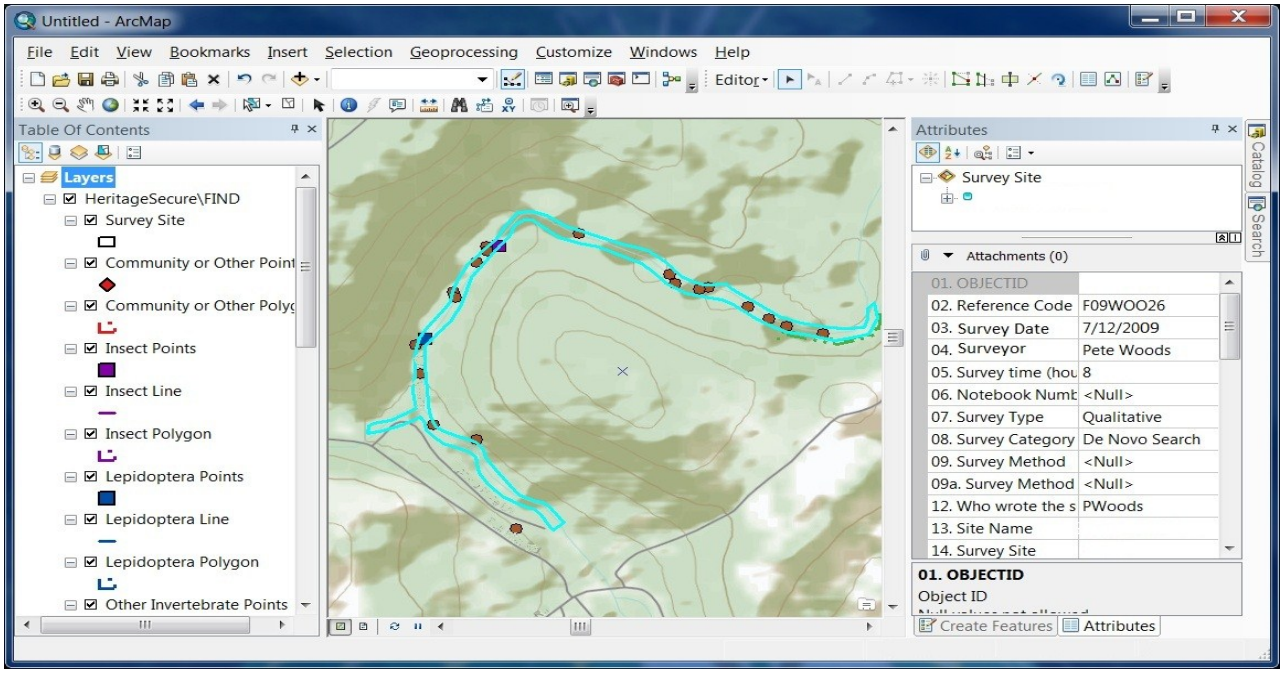
FIND at Work

Since its March 2012 release, FIND has been used by 25 Heritage staff members and has had more than 500 unique features submitted. The new geodatabase has allowed tighter collaboration among Heritage staff and increased quality control of the data via improved data flow methodology. Further, FIND has greatly reduced the amount of time it takes for the data to get from the field to a fully processed state. It is now possible for an element occurrence to be recorded and processed within a few days!

What's next for FIND?

DM has already begun planning for FIND 2.0, which will be built from the ground up on the newly released ArcGIS 10.1. While the overall FIND workflow will remain largely the same, end-users will appreciate the simplified architecture of the geodatabase and an overhaul of the attribute fields. FIND 2.0 will be the first version to be open for use by all partners within the Pennsylvania Natural Heritage Program and will serve as the basis for all future enhancements.

Long-term enhancements for FIND are aimed at increasing ease of use and access. A real-time web-based application is planned allowing authorized access to FIND via a web-browser. This web-based application would be beneficial for users who are unable to use or who do not have access to ArcGIS Desktop. Development of FIND-Mobile applications for Apple iOS and Google Android devices are planned for users who do not have compatible GPS units but do have a GPS-enabled smartphone or tablet.



Authorized users can easily access attribute information for all data in FIND. Here, a user reviews the attribute information for a Survey Site polygon in FIND-Desktop.

Insects Abound in Slaughtering Ground

by

Betsy Leppo

In1993, the Clinton County Natural Heritage Inventory noted the Slaughtering Ground Barrens located on the rolling terrain of the High Allegheny Plateau about 13 miles west-northwest of Lock Haven. The barrens actually extend beyond the mapped Natural Heritage Area and include Bureau of Forestry (BOF) and private lands. They are recognizable by extremely sandy soils and thickets of scrub oak (*Quercus ilicifolia*) spiked with rough-barked pitch pines (*Pinus rigida*). Dry oak forest is mixed in and around the barrens patches. The barrens are located at the headwaters of the Tangascootack and Beech creeks where the water table is very close to the surface. Despite the sandy soils, portions of the site flood readily and seasonal pools and seepage wetlands dot the landscape.

Betsy Leppo

Pitch pines and low shrubs thrive in the sandy soils of barrens habitats.

Pitch pine – scrub oak woodlands are relatively uncommon in Pennsylvania and often support unusual insects that thrive in the tough climate and poor soils typical of high elevation barrens. These 'barrens specialist' insects are uncommon or absent outside of barrens habitats. This study was devised to look for unique insect species or assemblages across many taxonomic groups to see if these barrens merit additional protection and management efforts. In order to tackle a project of this magnitude the Pennsylvania Natural Heritage Program (PNHP) partnered with experts at the Carnegie Museum of Natural History (CMNH). Our survey methods targeted a variety of insects by using yellow pans to attract pollinators, small pitfalls to trap ground dwellers, malaise traps to capture fliers, and blacklight traps to attract night fliers.

The project was labor intensive. At installation, we hand dug eighty holes for pitfall traps , then repeatedly reinstalled after rainstorms filled them with sand and water. Black bears were never seen during site visits, but apparently they find pickled bugs delicious when plucked from a malaise trap and drunk straight from the sample bottle. Hours of mending were required to repair the delicate trap netting, only to have it shredded again.

Collecting the samples was just the beginning. CMNH staff sorted, prepared, and labeled over 11,000 specimens. To date a subset of over 5,000 of these have also been identified and databased. Emphasis for identification was placed on certain families of moths, beetles, and flies. Unidentified specimens are preserved in CMNH collections as a resource for future insect and conservation research. CMNH summarized the collection results and noted interesting finds in a report. The variety of insects found in these barrens was much less than other habitat types in Pennsylvania sampled in a similar fashion. Low species richness was expected due to the austere environmental conditions typical of barrens, which exclude many plants and animals from living there. However, the results also provided evidence that this site is unique and supports a number of rare insects.

Sixteen species of crane flies (Tipulidae) were identified. One notable species was the 'giant eastern crane fly' (*Pedicia albivitta*). This large crane fly is boldly patterned in white, rusty orange, and chocolate brown. The aquatic larvae are carnivorous and require clean cold streams, boggy areas, or hillside springs and water courses. One sample of leaf litter was collected and examined for terrestrial snails. A single one-gallon bag of leaves yielded an impressive 82 individuals and six species of terrestrial snails. Two species were new records for Clinton County (*Strobilops texasiana* and *Neohelix albolabris*). Sixty-eight species of ground

Betsy Leppo

John Rawlins and Vanessa Verdecia of the Carnegie Museum install pitfall traps for collecting ground-dwelling insects.


PA DCNR-Forestry Archive

Scaphinotus viduus

(carabid) beetles were identified but the samples were dominated by just four native species. Three species not native to North America were documented. Seven individuals of the beautiful *Scaphinotus viduus* were found. This large iridescent ground beetle of wet forests has long mouthparts that are well suited to probing the shells of its favorite prey item, snails. It injects a digestive enzyme into the shell to begin liquefying and pre-digesting its dinner.

Over one-hundred different species of scarab beetles were identified. Familiar members of this large and diverse superfamily include the Japanese and June beetles. A scarab beetle with a very interesting lifestyle was found, *Cremastocheilus castaneae*. These chunky black beetles with dimpled backs emerge en masse in early spring and congregate around ant nests where they find a mate. The beetles are 'myrmecophilous' because their lives are closely entwined with those of ants. Adult beetles may forcibly enter ant nests or the ants may drag them in as a potential food item. The beetles often encourage this by playing dead when ants are near. The ants discover they are unable to eat the beetle because of its thick outer skin. The beetles then find their way to the brood chambers where they feast upon ant larvae. Why do the ants tolerate this deception? The beetles secrete chemicals from their skin which the ants lick off. The ants appear to be pacified by this special potion and do not attack the beetles as they eat the ant brood. The beetles also lay their eggs in the ant nest. The beetle larvae feed upon decaying vegetation, not ant brood. But they benefit from the controlled climate in the nest and are protected from predators. Ant workers largely ignore the *Cremastocheilus* beetle larvae, yet they immediately attack other beetle larvae of similar size and shape.

The Lepidoptera (moths and butterflies) showed the greatest diversity among the focus groups and provided several exciting finds. A total of 4,157 specimens were identified and yielded 354 unique species. Fifteen moth and two butterfly species of special concern were documented. The butterflies Edwards' hairstreak (*Satyrium edwardsii*) and brown elfin (*Callophrys augustinus*) are found at sites with abundant food plants for their caterpillars, scrub oak and blueberries respectively. Several moths were found that had not been seen during extensive surveys in western Pennsylvania over the last 30 years, including the boreal sprawler moth (*Brachionycha borealis*). Nine species were new records for Clinton County and one species of looper moth (*Euchlaena milnei*) may be a new state record for Pennsylvania. These findings confirm the uniqueness of the moth community present at Slaughtering Ground Barrens.


Betsy Leppo

The brown elfin is never found far from its favorite food, blueberries. Caterpillars feed on the leaves and adults visit the flowers for nectar.

Going forward with this new information, the Western Pennsylvania Conservancy will explore adding protection to areas that are not part of BOF lands. Mapping the extensive matrix of exceptionally sandy soils and pitch pine-scrub oak habitat will define the full extent of the targeted conservation area. Numerous land owners are involved and some gas development infrastructure is present. Managing the vegetation to maintain the dominance of pitch pine and scrub oak will be key to conserving the associated plants and animals of this community type. Introducing or reintroducing fire could be an effective means of restoring and maintaining the habitat. Controlled burns have been used successfully in many other barrens throughout the northeast and are currently being employed in the nearby Scotia Barrens in Centre County (State Game Lands 176). The Bureau of Forestry will be able to manage part of the area, but a broader effort will be needed to realize the full potential of this site in supporting native biodiversity.

The beauty of this landscape, a rich mosaic of barrens, forests, and wetlands, deserves special mention. I will never forget watching swarms of dragonflies feeding over the meadows, or an evening storm sweeping over the mountains while woodcocks whirled and spring peepers called. Moments like these may also be granted to visitors who spend time in this barren, but far from desolate, wilderness.

Collaborations

We are in a unique and flexible position as a state Heritage program in having both state agency and NGO partners. Through WPC, we can provide services, capacity, and organization to numerous conservation groups and entities, and with the participation of WPC's land and watershed conservation departments, we can expand the breadth of Natural Heritage Program projects. Whether managing a marsh bird survey for Maryland Audubon or organizing a gathering of botanists from the state and region, we can use our expertise to further a variety of conservation efforts.

Setting the Stage for Coastal Wetland Conservation: Maryland's Marsh Bird Survey

With funding from Audubon Maryland-DC, PNHP staff engaged in a cross-state, collaborative project focused on the conservation of Atlantic Coast tidal marshes. These coastal wetlands support more vertebrate species specially adapted to the extreme tidal marsh environment (salinity and tides) than anywhere else in the world. In addition to widespread threats like invasives and development, Atlantic tidal marshes face potentially severe habitat loss and degradation over the next 50-100 years from rising sea-levels as a result of global climate change. Altogether, there are 26 bird species that use tidal marshes during the breeding season that are listed as Species of Greatest Conservation Need by Atlantic Coast states.

Rob Criswell

David Yeany conducts a marsh bird survey at Pocomoke Sound Wildlife Management Area.

David Yeany, PNHP Conservation Planner and Ornithologist, coordinated the second and final year of Maryland's portion of the Saltmarsh Habitat and Avian Research Program (SHARP), a survey of tidal marsh birds throughout the northeastern U.S. from Virginia to Maine. From mid-April to mid-July, we conducted 763 avian point count surveys across the Delmarva Peninsula of Maryland and Virginia. Of the 259 locations that we surveyed, 70% of them were accessible only by boat. We also measured habitat conditions and assessed marsh plant communities at each location. Using methods adapted from the National Marsh Bird Monitoring Protocol, we played marsh bird vocalizations to solicit responses from secretive species like least bittern and king rail.

In total, we recorded 138 bird species with some of the highlights including each of the focal species: 97 American black ducks, 833 clapper rails, 434 willets, 999 seaside sparrows, 211 saltmarsh sparrows, and 5 Nelson's sparrows (total detection). Adding to the success of the survey we also detected 219 Virginia rails, 33 least bitterns, 10 king rails, 9 common moorhens, one pied-billed grebe, and an American bittern. These data will be used to estimate population numbers for tidal marsh birds, map breeding distributions, determine population changes over the past two decades, and identify the most critical areas for tidal marsh bird conservation and habitat protection.

David Yeany

Saltmarsh sparrow is a globally vulnerable species confined to the high marsh zone of Atlantic coastal wetlands. Nests are constructed in patches of short smooth cordgrass and saltmeadow hay found in the high marsh zone.

David Yeany

Seaside sparrow is a common but declining denizen of tidal marshes.

Collaborations

Pennsylvania Botany Symposium November 9-10, 2012


Paul Wiegman

Mark your calendar for the inaugural Pennsylvania Botany Symposium at Powdermill Nature Reserve in the beautiful Laurel Highlands of western Pennsylvania!

Several PHNP scientists have teamed up with botanists from various institutions to initiate a biannual meeting that brings academic and serious amateur botanists together to share current research in the region.

Invited speakers will cover a variety of topics, including important recent field discoveries, early botany in North America, species interactions in a Pennsylvania forest, lichens of Pennsylvania, recovery of rare native plants after invasive species removal, and addressing the shortage of botanical capacity in academia. The keynote address will be given by Robert F. C. Naczi, PhD, Arthur Cronquist Curator of North American Botany at the New York Botanical Garden. Dr. Naczi is currently revising the *Manual of Vascular Plants of Northeastern United States and Canada*, known to most botanists as "Gleason and Cronquist."

Other speakers include Ernie Schuyler, Academy of Natural Sciences; James Lendemer, New York Botanical Garden; Jim Bissell, Cleveland Museum of Natural History; Susan Kalisz, University of Pittsburgh; Andrea Kramer, Botanic Gardens International; and Joe Isaac, Civil and Environmental Consultants.

Please join us for an informative program and opportunities to network with fellow plant enthusiasts. For more information, visit paconserve.org/261/upcoming-events.

Canby's Mountain Lover is Under Attack

PNHP botanists are working on a small grant from the West Virginia DNR to evaluate the impact of euonymus scale (*Unaspis euonymi*) on West Virginia populations of the Globally Imperiled (G2) Canby's mountain lover (*Paxistima canbyi*), and to do general heritage botanical surveys.

When we learned that about 80% of the Canby's mountain lover occurrences in Kentucky are infested with this scale and are in serious decline, we checked the three populations at the northern limit of the range in Bedford County, Pennsylvania. We found the scale at two of those populations and are treating it with horticultural oil at the site owned by the Western Pennsylvania Conservancy.

So far we have not found the scale on Canby's mountain lover in West Virginia, but some of the populations could not be relocated, and the population that we did find had notably smaller population sizes than previously reported. At one site, we found scale-infested wintercreeper euonymus (*Euonymus fortunei*) about 200 m from Canby's mountain lover. We pulled, bagged, and removed all of the wintercreeper, which is not native to North America, and is reportedly the primary vector for euonymus scale in Kentucky.

It is not clear whether the apparent decline of other populations of Canby's mountain lover in West Virginia is related to the scale, but even if not, this scale clearly represents a serious threat to the continued viability of this plant.


The Ohio State University

Different phases of Euonymus scale on a *Paxistima* leaf. The white males are the most conspicuous.

Blomquist Foray

This annual gathering of amateur and professional bryologists and lichenologists, was hosted at the Western Pennsylvania Conservancy's Barn at Fallingwater and Ohiopyle State Park on April 27-29, 2012. The event yielded several new bryophyte and lichen records for Fayette County and the state. Of note was a pin-lichen, *Chaenothecopsis vainioana,* collected in the Bear Run Nature Reserve on a large white oak tree. According to John Guccion, a lichenologist from Maryland, this collection is thought to be one of only six in all of North America.

Notes from the Field

County Inventory
Field work for the Beaver County Natural Heritage Inventory Update began in the spring with snow trillium surveys, followed by surveys for a variety of plant and animal targets. Many old records have been updated, and a number of new populations of rare species have been found. Highlights include finding a new patch of declined trillium hybrids, revisiting a very healthy population of heartleaf meehania, and finding a population of midland clubtails.

Pete Woods

Heartleaf meehania

The first field season of the updates to the Chester and Berks CNHIs is focusing on updating records older than 10 years. Surveys have reconfirmed the presence of 13 occurrences of plant species of concern, as well as a new record for Halloween pennant, a dragonfly species of concern. An occurrence of the globally vulnerable bog bluegrass (*Poa paludigena*) was updated in seeps in Chester County. Another species of note is the state endangered butterfly pea (*Clitoria mariana*). The Berks County location is the only one known from the state. Surveys for this project will continue through the summer of 2013.

Conservation Planning
In April, we presented a talk at the Goddard Forum at Penn State University entitled "Marcellus Shale Impacts on Natural Heritage Areas in Pennsylvania." This talk, part of the conference theme of natural gas impacts on forest ecosystems, covered the current and potential impacts to rare, threatened, and endangered species in the state.

Conservation Planning staff have been assisting NatureServe staff on the development of the "LandScope Pennsylvania" website including the collection and development of GIS data, conservation stories, photos, and other multimedia content. The site will be launched by the end of the summer.

Christopher Tracey was named chair of the Biodiversity Plan Committee for the Lake Erie Allegheny Partnership. He will be coordinating the development of a biodiversity conservation plan for the glaciated section of northwestern Pennsylvania, as well as the adjacent sections of New York and Ohio.

Botany/Ecology
The bioblitz on June 2 at Kings Gap State Park was part of a larger natural resources inventory project for state parks in the South Mountain area including, Caledonia, Pine Grove Furnace, Mont Alto, and Kings Gap. Fieldwork for this multi-park project began in March and will continue throughout the summer. In May, we completed vegetation maps and assessments for each park. These assessments detail the composition and condition of each major forest community within the park and can be used for monitoring forest health and for ecological management. During recent rare plant surveys of Kings Gap and Mont Alto, we found four plant species of special concern on the new tract of Kings Gap State Park. We also conducted bat mist net surveys on South Mountain but unfortunately captured only big brown bats and red bats. The apparent absence of the smaller species of hibernating bats may be a result of the devastating effects of WNS. Other recent field surveys include bat mist-netting at Caledonia State Park.

Stephanie Seymour

A Skunk Cabbage - Golden Saxifrage Seep at Pine Grove Furnace State Park

Notable botanical finds this quarter include a liverwort, *Moerckia flotoviana*, on the dune slacks at Erie Bluffs State Park and a moss, *Diphyscium foliosum*, along the road to Kings Gap State Park. Continued collecting efforts for bryophytes and lichens will certainly yield more county and state records, while providing a more complete picture of species distributions throughout Pennsylvania.

Surveys on State Forests continue to yield interesting finds. In Forbes State Forest, PNHP surveyors found a population of the globally rare Appalachian tiger beetle (*Cicindela ancocisonensis*). Although Pennsylvania is in the middle of the range of this species, there are very few recent records from the commonwealth.

Pete Woods

Appalachian tiger beetle

We received funding from the U.S. Fish and Wildlife Section 6 Endangered Species Program to support the initiation of a long-term monitoring program for northeastern bulrush (*Scirpus ancistrochaetus*). Planning for this project began in May with a partner meeting to discuss best methods for consistent data collection based on past and present efforts. Currently, we are refining the low-intensity monitoring protocol, identifying sites, and coordinating site visits for low-intensity monitoring for this year. We are also working with the DCNR-BOF Ecological Services Section to identify potential northeastern bulrush sites for high-intensity monitoring. Additional funding for this project has been requested through a proposal to the Wild Resource Conservation Program that would further support our high-intensity monitoring effort.

PNHP began fieldwork on a joint project with the National Park Service and USGS to inventory and map submerged aquatic vegetation (SAV) in the Delaware River. In August, we are conducting SAV surveys in the Delaware River within the Upper Delaware Scenic and Recreational River and Delaware Water Gap National Recreational Area. In June, we spent several days in the river refining logistics for the study which included access planning, feasibility of establishing benchmarks relative to documented SAV beds, and data collection methodology. We also spent time in the Delaware River looking for *Didymosphenia geminate*, also known as didymo or rock snot, a freshwater microscopic diatom whose large blooms can potentially alter benthic habitat within a river ecosystem. Numerous accounts of widespread blooms in the Delaware River were reported in April and May of this year. We found a remnant example of a bloom adjacent to a boat ramp and visited a few sites where the blooms had been reduced to the 'short stalk' form.

PNHP continues to make progress with the Pennsylvania Game Lands Management Tool project (PGLMT). Conservation planning polygons (CPP) for plants were completed for game lands throughout Pennsylvania. We are currently working closely with DCNR to review these polygons, so that CPPs can be utilized for the PGLMT. We also are now working with the Pennsylvania Fish and Boat Commission to update records and go forth with the tasks needed for the PLGMT. Collaboration will include inventory updates, development of best management practices, and site-specific management plans for all PFBC jurisdictional species on state game lands. PNHP continues to conduct inventory updates on state game lands: plant records have been updated in Pymatuning Swamp and Hartstown Swamp (SGL 214), Bog Candle Fen (SGL 122), and Pine Swamp (SGL 130). Additional surveys were conducted in Huntingdon County at Game Lands 118, 112, and 99, and Game Land 49 in Bedford County. Updates to Lepidoptera records have been initiated at several state game lands.

Information Management

The Field Information Networked Database (FIND) is 'live' and is being used in the field and office for data entry and data processing. We held a meeting in Pittsburgh on June 14 to review user feedback and prioritize the changes and improvements that will be included in FIND 2.0.

The Pennsylvania iMap site now has GIS reference layers up and running. Procedures were developed to ensure certainty in species identification and record location, to maintain the database integrity, and for data agreements with partners.

With funding from the Great Lakes Restoration Initiative (GLRI) provided through the Pennsylvania Fish and Boat Commission, we are continuing development of the Pennsylvania node of the iMapInvasives website for aquatic invasive species in the Lake Erie and adjacent watersheds. The database will track the location, assessment, and treatment of the invasives, as well as emerging new threats.

During the second quarter, PNHP staff attended the iMap Lead Partner Organization meeting at the NatureServe conference in Oregon in April. We also made initial contact with the Erie Cooperative Weed Management unit and met with staff from the Pennsylvania Fish and Boat Commission to demonstrate iMap and discuss two-way invasive species data sharing.

Conservation Planning Polygon (CPP) Development continues. We have created draft polygons for almost all of the extant plant and community records in the PNHP database - Biotics. Current specifications and completed polygons are under review by DCNR. We have also begun creating draft polygons for Lepidoptera, amphibians, and reptiles, and working with WPC and PFBC staff to resolve questions.

Zoology

We surveyed eight state game lands to update records of butterflies and moths. We updated records for three butterflies, the falcate orangetip, common roadside skipper, and bog copper. We found new occurrences of five butterflies, the brown elfin, zebra swallowtail, silvery checkerspot, two-spotted skipper, and Atlantis fritillary, and two dragonflies, the petite emerald and American emerald.

Betsy Leppo

Bog copper

We conducted surveys on state game lands in Sullivan County to update the arctic skipper (*Carterocephalus palaemon mandan*), silver-bordered fritillary (*Boloria selene myrina*), Harris' checkerspots (*Chlosyne harrisii*), bog copper (*Lycaena epixanthe*), Indian skipper (*Hesperia sassacus*), and Atlantis fritillary (*Speyeria atlantis*) butterfly records. The early warm weather this spring affected the flight window of many insects. By the third week of June we were in a mid-season butterfly lull and struck out on seeing most of these species. We were happy to find the bog copper continuing to thrive at one wetland and added a new record for the elusive two-spot skipper (*Eupheys bimacula*).

Kathy Gipe

Blandings turtle

In 2010 zoologist Ryan Miller completed a two year project funded by a state wildlife grant from the PFBC to conduct surveys and a status assessment of the Blanding's turtle in Pennsylvania. This quarter herpetologist/nongame biologist Kathy Gipe with assistance from Ryan Miller led a new initiative to sample Blanding's turtles in Pennsylvania in cooperation with a regional wildlife grant that includes six states in the northeast. Traps were set and monitored for two weeks and one Blanding's turtle was captured for long term monitoring. Additional efforts will continue through 2012 with the intention of gathering samples for genetic analysis of the populations across the region.

PNHP invertebrate zoologist/nongame biologist, Dave Lieb, collaborated with outdoor staff writer for the Williamsport Sun-Gazette, Jessica Welshans, on a newspaper article to be published in July 2012 on the exotic crayfish problem in Pennsylvania with the goal to inform anglers of the dangers of crayfish introductions and prevent additional introductions in the commonwealth.

After heavy summer rains, we sampled vernal pools in Centre County for evidence of breeding of the eastern spadefoot. One pool was documented as a breeding site for the elusive toad, a state endangered species.

Kathy Gipe

Eastern spadefoot toads require fish-free, isolated ephemeral ponds for breeding.

Field surveys and habitat assessments have resumed for the northern water shrew project (*Sorex palustris*). In April and May, water shrew surveys were conducted on private land owned by Hancock Timber and state forest lands including Forbes, Loyalsock, Susquehannock, and Tioga state forests. Out of 34 small mammal traplines maintained this quarter, nine new occurrences of the northern water shrew and one new occurrence of the rock shrew (a county record for Tioga County) were documented. In June, habitat assessments were completed at the 15 sites where water shrews had been documented in 2011 and 2012.

Charlie Eichelberger assisted the PGC with an attempt to band peregrine falcon chicks. Apparently, the nest ledge had been raided by a predator as all of the chicks were unfortunately gone.

We completed snorkel and scuba surveys in six areas of Presque Isle Bay for native mussels. Project partners from DT Energy, Central Michigan University, and U.S. Geological Survey assisted with the surveys. Shells and live mussels from 12 species were located in 10 surveys.

PNHP staff assessed habitat and collected water chemistry data during surveys of freshwater mussels conducted at five sites on the Susquehanna River and its tributaries in the Lower Susquehanna River basin. Data compilation for species distribution modeling and evaluation of analysis tools have begun. Additional mussel surveys, habitat/chemistry data collection, and final modeling of mussel habitat are planned.

Timber rattlesnake surveys were conducted in Fayette, Centre, Clearfield, Lycoming, Somerset, and Sullivan Counties, and a good number of critical basking areas have been documented. Survey efforts also targeted the state-endangered eastern massasauga, at both known populations and at potential habitats.

Pete Woods

Eastern massasauga rattlesnake

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	Cumulative Total	Percent of Annual Goal
Biotics Records Updated	200	127	127	254	100%
New EOs Documented	800	169	198	367	46%
New Records Entered into HGIS	300	96	169	265	88%
Field Surveys Reported	500	32	130	162	32%
New CPPs Developed	3000	1037	3792	4829	100%
NHAs Updated	120	29	52	81	68%
Outreach to Local Government	20	2	1	3	15%

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 Reported 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.