PENNSYLVANIA'S ENDANGERED AND THREATENED BIRDS AND MAMMALS

ENDANGERED BIRDS

American Bittern[4]
Black-crowned Night-Heron[3]
Blackpoll Warbler[3,4]
Black Tern[4]
Common Tern[3,4]
Dickcissel[3]
Great Egret[3]
King Rail[3]
Least Bittern[3,4]
Loggerhead Shrike[3,4]
Peregrine Falcon[3]
Sedge Wren[3,4]
Short-eared Owl[3,4]
Upland Sandpiper[3,4]
Yellow-bellied Flycatcher[3,4]
Yellow-crowned Night-Heron[3]

THREATENED BIRDS

Long-eared Owl[3,4]
Northern Harrier[3,4]
Osprey[3]

EXTIRPATED

Piping Plover[2]

ENDANGERED MAMMALS

Delmarva Fox Squirrel[1]
Indiana Bat[1]
Least Shrew
Northern Flying Squirrel

THREATENED MAMMALS

Allegheny Woodrat
Small-footed Bat
West Virginia Water Shrew
Northern Long-eared Bat[5]

[1]Federally endangered
[2]Great Lakes population federally endangered
[3]Protected under federal Migratory Bird Treaty Act
[4]USFWS Migratory Bird of Conservation Concern
[5]Federally threatened

Pennsylvania Game Commission
Bureau of Wildlife Management

WILDLIFE DIVERSITY PROGRAM

2014

Managing Pennsylvania's wild birds, wild mammals and their habitats for current and future generations

2014

Bureau of Wildlife Management

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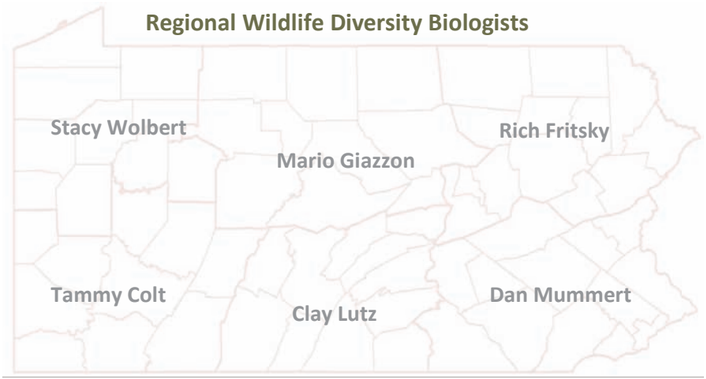

Cover Photo

Northern Long-eared Bat

By Al Hicks, NYS Department of Environmental Conservation

Report compilation and layout

Jennifer DeCecco

If citing this report, reference

Wildlife Diversity Program 2014 Report

Bureau of Wildlife Management

Pennsylvania Game Commission

2001 Elmerton Avenue

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Allegheny Woodrat the Focus of a Multi-Partner Effort


Photo Joe Kosack, PGC

The Allegheny woodrat has little in common with its non-native cousin, the Norway rat, a common pest of urban areas. They are a rare and solitary animal that inhabit rocky areas away from human populations and are only social during the mating season. Their decline in Pennsylvania has been linked to several factors, including the loss of the American chestnut and oak acorns (a favorite food), forest fragmentation and infection and death due to a parasite carried by raccoons. They are a state threatened species and a Species of Greatest Conservation Need in the State Wildlife Action Plan. The majority of known populations in the eastern half of Pennsylvania are now extirpated and numbers elsewhere in the state are in severe decline.

Surveys by Game Commission staff in 2014 were focused on trapping in areas of known populations as well as surveying potential sites for signs of activity. Testing of camera traps as a new potential survey technique produced multiple woodrat photos even though not every site had visible signs of active woodrats. Following this initial testing phase, plans are to determine an appropriate level of effort needed to detect activity.

Regional wildlife biologists also partnered with The Nature Conservancy to plant 13 advanced-generation American chestnut seeds over 1.5 acres in the Thousand Steps site on State Game Lands 112. At three other sites in the south-central region, several hundred black birch and maple trees were felled to increase light to the forest floor for shrub and forb growth, and to prepare for future plantings of elderberry and chestnuts.

Despite ongoing work by staff and researchers, loss of genetic diversity in the existing woodrat population may inhibit recovery. A research project at Indiana University of Pennsylvania supported by a State Wildlife Grant will create an atlas of genetic diversity among woodrats in Pennsylvania. In 2014, 74 Woodrats at 30 different sites were trapped and captured and tissue samples collected for use in the genetic program. Over two seasons, a total of 174 different sites have been searched for signs of activity with 202 woodrats captured and 179 tissue samples collected. The work at Indiana University of Pennsylvania will identify source populations as well as those that require genetic restoration. This will help to inform the prioritization of habitat management as well as future reintroduction goals on formerly occupied habitats.

The Allegheny woodrat (left; PA threatened) is the focus of research and conservation efforts by the Game Commission and partners to assist this declining species throughout its remaining range.

Mammal Atlas Underway

In 2014, the Game Commission officially launched a 10-year initiative to survey the entire state and produce range maps of all mammal species. After securing two years of funding through a Pittman-Robertson grant, work began immediately to identify a partner to develop a website, test techniques for rarely studied or encountered species, design technical survey plans as well as incorporate the valued effort from Pennsylvania's residents and sportsmen.

Staff obtained much-needed equipment including trail cameras and cage, box, mole, and weasel traps (see photo above). In the fall, field techniques testing began in State Game Lands 176 and sites in the Poconos and results of surveys seemed promising. A variety of species were documented, including a fisher. As the end of 2014 approached, specialized surveys for spotted skunk, water shrew and weasels were conducted, and trapping for small mammals began in Spring 2015.

Summer Bat Surveys Document Declines

The little brown bat and big brown bat (both pictured, right) often use man-made structures, such as old houses and barns to raise their young (called pups) during the summer months. Since 1989, the Appalachian Bat Count has used a combination of volunteers and state and federal agencies to count the emergence of adults and pups at roosts across the state during the summer. Wildlife Diversity biologists have helped with these counts as well as designed, erected and installed bat boxes in locations with good habitat. The data from these counts provide valuable information on population trends and are especially important since the little brown bat has been severely affected by white-nose syndrome. During the 2014 season:

- ***A total of 200 reports were submitted, which was a 9% increase over 2013.***
- ***The majority of reports came from counts at bat boxes (87), occupied houses (34), and barns (32).***
- ***The average number of bats per count were at the lowest level since the surveys began in 1989.***
- ***Counts show that little brown bat populations have declined by 93%, whereas big brown bat populations have experienced a more modest 23% decline.***

Although there are several factors contributing to the downward decline seen in these populations, none are as severe as the effect of white-nose syndrome. Indications are that the little brown bat (pictured, below) has suffered much more significantly from the disease than the big brown bat. These surveys will continue next year with the results furthering the understanding of summer bat colonies, use of man-made structures and the effects of the disease on populations.

Photo Greg Turner, PGC

Photo Greg Turner, PGC

Bat Acoustic Transect Surveys

Regional wildlife diversity biologists initiated an annual Bat Acoustic Transect Survey in 2014 to assess trends in bat populations over time. Acoustic surveys can be an efficient, non-invasive technique for collecting data on species distribution, and trends in species composition or abundance. They can also detect the presence of endangered, threatened, rare and previously undocumented bat species. The technique uses bat vocalizations, which are recorded by a microphone and then analyzed by software that can compare these recordings to known vocalizations to identify to species, or just to genus or guild.

During 35 nights of sampling, biologists recorded 2,921 bat detections. Nearly 35% of those recordings were identifiable to species. The majority of those identified were big brown bat (67%), followed by hoary bat (14%), eastern red bat (11.3%), silver-haired bat (7.1%), and tri-colored bat (0.6%). Indiana bat, little brown bat, eastern small-footed bat, and northern long-eared bat were not identified in the recordings.

The high number of acoustic detections of the big brown bat supports the theory that this species is less affected than others by white-nose syndrome, especially the little brown bat. This may be due to their larger body size and tendency to congregate in small clusters during hibernation. Other data suggests that they may simply not have the same rates of infection as other cave-dwelling species. The other bats recorded are migratory in winter and have not been affected by the disease; although they are still subject to other human pressures such as wind turbines, which kill an estimated 27 bats per turbine each year. As wind energy and other development pressures continue, their influence may also become even more significant to those bat populations already in decline due to the spread of white-nose syndrome.

Photo Wayne Laubscher, PGC

Pennsylvanians care about wildlife! Millions of Pennsylvania residents engage in wildlife viewing, photography and hunting. And, they strongly support that conserving nongame wildlife is an important function of the Game Commission. A statewide survey conducted for the state's Wildlife Action Plan revision affirms that protection of threatened and endangered species, in particular, are very important activities (see p 4).

Public support is critical to our conservation efforts, and that support takes many forms. That support includes volunteers contributing to a wide range of citizen science projects, and even financial donations to projects such as "Project SNOWstorm," (which tracked the unprecedented invasion of snowy owls last year with private donations). But nongame wildlife conservation does not have a direct funding mechanism. Tangible support, in the form of stable funding, is needed to address the growing challenges that wildlife conservation faces today. The extensive work of conservation outlined within this report is done on behalf of all of society who obtain benefits and enjoyment from wildlife, including the millions of wildlife watchers and not just the license-buying hunters and trappers. We therefore need to translate the broad interest in wildlife into new, stable sources of funding. A national Blue Ribbon Panel is investigating the options for broader public support of these activities, including business and industrial interests (see page 5). That panel is focused on the question: "What is the best and most equitable way to fund fish and wildlife conservation to ensure its sustainability?" Everyone benefits; broad-based support is needed.

Increased attention to wildlife conservation is needed on all fronts in the face of the challenges today. The rise in wildlife diseases, such as white-nose syndrome in bats and avian influenza affecting poultry and raptors, represent monumental challenges. Changing land-use patterns and fragmentation are altering critical habitats at an alarming rate. Sorting through these challenges and directing our actions to the most critical needs is what Pennsylvania's comprehensive Wildlife Action Plan is designed to accomplish. The newly revised plan, expected in 2016, will continue to be a blueprint for our actions over the next decade, including research to understand root causes of population declines, habitat management to improve conditions for targeted species, and ongoing coordination to rally the broad support for wildlife conservation to a common vision for conservation.

The Pennsylvania Game Commission has a proud tradition of managing all of the birds and mammals under our charge. Celebrating the 120th anniversary of the formation of the Game Commission in 2015, we can properly reflect on the scientific management, habitat conservation, and wildlife protection that have worked together to sustain this wildlife diversity for consumptive and non-consumptive purposes. Whether it was promoting bluebird boxes or fisher reintroduction, we have long recognized a need and taken the conservations actions and prudent regulation required to benefit wildlife populations. We now need to respond to today's challenges and maintain this treasured resource for the next generation.

Dan Brauning

Wildlife Diversity Division Chief

Rusty Blackbird by A. Reago and C. McClaren, Wikicommons

Strong Public Support for All Wildlife

A recently updated public opinion survey (the original survey was published in 1996) by the Game Commission in cooperation with the Fish and Boat Commission quantifies the importance of wildlife diversity to our state citizens. In this survey, a representative sample of Pennsylvania residents 18 years and older was asked by telephone about wildlife issues and the responsibilities of each of the Commissions in the state.

At least half of those surveyed had participated in at least one outdoor activity within the past 2 years (bird and wildlife watching was the most popular). Although the purpose of the survey was to sample opinion on nongame wildlife issues, an overwhelming majority of those responding had favorable views of fishing and hunting.

Those surveyed responded that:

- ***Habitat loss/fragmentation/degradation, urban sprawl and overpopulation are the most important concerns currently facing wildlife.***
- ***Managing and conserving threatened and endangered species was one of the most important functions of the Commissions, with 75% rating it as very important.***
- ***Managing and conserving nongame wildlife was an important function of the Commissions, with 62% rating it as very important.***
- ***Restoring and improving habitat, addressing invasive species, conservation actions for nongame species at risk of becoming endangered (such as habitat protection and improvement) and educating the public about nongame wildlife were important roles of the Commission, with 67% or more of respondents stating these roles as very important.***
- ***Respondents also believed that more effort should be spent on all wildlife, with 37% believing more effort should be spent on bird species, and 28% believing more effort should be spent on mammal species.***
- ***The surveys documented a 14% increase in the number of respondents who believed that conserving all wildlife was very important over the number of those who gave the same response in 1996.***

The strong support for all wildlife demonstrated in these surveys is reflected by the large number of volunteers in many of the projects and surveys that the Game Commission hosts, the number of views and downloads of Wildlife Diversity Division webpages, and attendance at presentations by Wildlife Diversity biologists. This survey was funded through the State Wildlife Grant Program and the results will be used to further enhance the State Wildlife Action Plan, which is expected to be submitted in 2015 (see next page). Full results of the survey are available on the Game Commission's website as:

Pennsylvania Residents' Opinions on and Attitudes Toward Nongame Wildlife—revised (2014).

Northern Long-Eared Bat Federally Listed

As the name suggests, the northern long-eared bat is distinguished by its relatively long ears as compared to other bats in the same *Myotis* genus (the little brown bat and Indiana bat). This bat spends the winter months in caves, mines shafts or tunnels in small crevices or cracks. During the summer, these bats will roost singly or in colonies underneath bark, in tree cavities or in crevices of both live and dead trees (more rarely in structures like barns and sheds). The northern long-eared bat is found throughout most of the state.

In April 2015, after two years of review, the northern long-eared bat was listed as a federally threatened species under the Endangered Species Act. Citing its importance both economically and ecologically, the U.S. Fish and Wildlife Service determined that this species met the criteria for listing, primarily due to its rapidly declining numbers due to white-nose syndrome. The Fish and Wildlife Service also issued an interim special rule (called a 4(d) exclusion) that eliminates unnecessary regulatory requirements for landowners, land managers, government agencies and others within its range.

Photo Greg Turner, PGC

These northern long-eared bats (above) were from the Durham Iron Mine in Bucks County in 2006. Since that time, the more than 850 northern long-eared bats found at this location have been extirpated due to white-nose syndrome. This species has been severely affected by the disease and was recently listed as a federally threatened species by the U.S. Fish and Wildlife Service. The listing helps to focus conservation planning and funding, raises awareness that can lead to additional opportunities and partners, and by regulation protects listed species from intentional and unintentional harm.

Two colleagues from Bucknell University join Wildlife Diversity Biologist Greg Turner (right) and Biologist Aide Colleen Pritcher (standing, center) after a visit to Barton cave in Fayette County to retrieve data loggers attached to hibernating bats.

Work Continues with All Bat Species

The Game Commission is working to purchase and protect properties with known hibernacula of state and federally listed bat species. Many of these sites have been gated to further protect from disturbance during winter.

- ***A cave on State Game Lands 51 in Fayette County that was purchased in 2012 was gated in 2014. The 4 mine openings and 3 cave openings contains small-footed bats (mine) and northern long-eared bats (cave).***
- ***The purchase of Glen Lyon Mine in Luzerne County was recently approved and represents the largest known bat hibernaculum following declines due to white-nose syndrome, and the third largest known Indiana bat hibernaculum.***
- ***Two mine openings (one existing and one that was dug open) near the Canoe Creek Mine in Blair County, have been gated. A northern long-eared bat was found at this location, and the mine is near an important Indiana bat hibernaculum.***

A summer maternity colony of Indiana bats near Reading is also active and biologists have been working with this population for the past several years. Several bats have been banded and tracked from this colony to winter hibernacula sites in New York (130 miles away) and to Kentucky in winter (420 miles away). This represents the longest known migration of an Indiana bat between summer and winter roosting sites.

Game Commission Assists White-Nose Syndrome Efforts


Photo Al Hicks, NYS DEC

White-nose syndrome was first detected in Pennsylvania in 2008 and has affected all species of cave-dwelling bats, including these little brown bats (above).

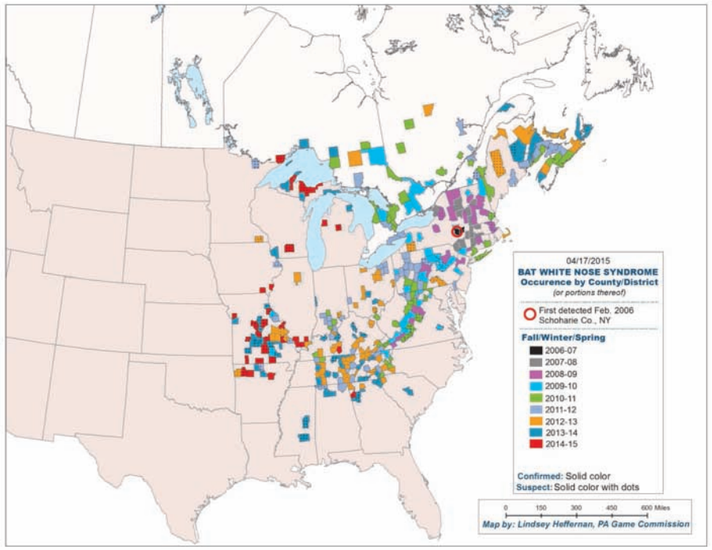
White-nose syndrome continues to spread both west and southward through the United States, and into Canada. The disease, which has killed millions of bats nationwide since its discovery in New York in 2006, first appeared in Pennsylvania in 2008. White-nose syndrome is caused by a cold-loving fungus (*Pseudogymnoascus destructans*) that is now common in the caves, mine shafts and tunnels that certain bat species will use to hibernate (called hibernacula). Although there is still much to learn about the disease, the fungus works by infecting winter colonies. It interrupts bat hibernation, ultimately depleting them of their fat reserves and causing them to starve by mid-winter, when no food is available.

The latest data (see map below) show that the disease has reached 25 states and has affected all species of cave-dwelling bats in 33 of Pennsylvania's 67 counties. In Pennsylvania, this includes the big brown bat, tri-colored bat, Indiana bat, little brown bat, eastern small-footed bat, and northern long-eared bat.

The Game Commission continues to work with other state, national, and international wildlife agencies to assist with research and education of this deadly disease.

In particular, Game Commission biologists have continued their work with U.S. Geological Survey scientists and others pioneering the work of using UV light as a non-lethal method of diagnosing white-nose syndrome in bats. Their discovery shows when UV light is directed at the wings of an infected bat, it produces a yellow-orange glow that indicates the fungus is present. Recently published research discovered the mechanism by which this works. This finding has eliminated a significant problem in studying the disease in that biologists no longer have to euthanize a bat to confirm the animal is infected. Their work has been published in professional journals, presented at meetings and is being used by researchers both in the United States and Europe.

Despite severe declines of cave-dwelling bats, the Game Commission continues to study survivors. As survivors are captured, they are marked with a unique forearm band. Many of these banded individuals have been recaptured again in different years, noting that they have truly survived their encounter with the disease. By studying the survivors, the Game Commission has also been able to note that although little brown bats get infected every year, the amount of infection is decreasing and survivors are able to increase their fat supply as they enter hibernation. This is believed to help prevent them from running out of energy during the long winter when food is not available. The Game Commission also continues to partner with other colleagues looking for a treatment that may help reduce the amount of infection bats get, and thus improve their survival.



White-nose syndrome continues to spread through the United States and Canada from its initial detection in New York in 2006. Produced for national use by L. Heffernan, Pennsylvania Game Commission.

State Wildlife Action Plan Update

PENNSYLVANIA
WILDLIFE ACTION PLAN

The State Wildlife Action Plan aims to protect and enhance Species of Greatest Conservation Need. These include federal or state listed, such as the northern flying squirrel (above; PA endangered), vulnerable species (i.e., declining trends, many threats) or more common species for which Pennsylvania has stewardship responsibility within the Northeast. The 2005 State Wildlife Action Plan included 79 birds and 22 mammals, among others, on which to focus proactive research and management. Since then, the Game Commission and partners have implemented actions benefitting each of the Species of Greatest Conservation Need, as well as many more species that share the same habitat.

Nine years ago, the U.S. Fish and Wildlife Service approved Pennsylvania's first State Wildlife Action Plan, the comprehensive conservation blueprint for fish, wildlife and habitats in the state. This plan allows eligibility for federal State and Tribal Wildlife Grants Program (also known as State Wildlife Grants) funds that support the Game Commission's Wildlife Diversity Program and implementation of priority State Wildlife Action Plan actions through third-party projects. Split equally between the PA Fish and Boat Commission and PA Game Commission, the approximately $25 million provided to Pennsylvania since 2001 has supported 110 projects for the betterment of Species of Greatest Conservation Need and its habitats. The 2014 results of this work are showcased throughout this annual report.

To keep the plan current, Congress requires a comprehensive review and revision within 10 years. In preparation for the 2015 submission to the U.S. Fish and Wildlife Service, Game Commission and Fish and Boat Commission biologists, the PA Biological Survey and over 20 statewide conservation partners worked together to revise the list of Species of Greatest Conservation Need and evaluate the extent and condition of habitat supporting these species. During this process, we identified existing and emerging threats and specified actions to abate those threats. The refreshed goals, objectives and strategies will serve to improve the status of priority Species of Greatest Conservation Need in the coming 10 years.


Scarlet Tanager by Jacob Dingel

The scarlet tanager is a Species of Greatest Conservation Need listed in the State Wildlife Action Plan. A resident of forest interiors, it is sensitive to forest fragmentation. Pennsylvania is home to 17% of the global breeding population of this species.

Blue Ribbon Panel Seeks A Permanent Funding Source to Support All Wildlife

Federal support for the Wildlife Diversity Program comes from a yearly appropriation through Congress in the form of the State Wildlife Grant Program. This funding provides for the development and implementation of conservation programs for at-risk wildlife and is the only federal program that aims to avoid endangered species listings through prevention. However, this funding must be renewed on a yearly basis, and does not adequately cover all of the needs of at-risk wildlife.

Through the guidance of the Association of Fish and Wildlife Agencies, the professional organization that represents all state fish and wildlife agencies, a Blue Ribbon Panel has been formed and tasked with answering the question:

"What is the best and most equitable way to fund fish and wildlife conservation to ensure their sustainability?"

Its goal is to reimagine a 21st century model of funding conservation that bridges the funding gap between game and nongame species and secures a future for a diversity of fish and wildlife species and the economy. The Blue Ribbon Panel is a broad-based effort to bring business, energy, conservation and environmental interests to the table to focus on a funding solution to sustain the full array of fish and wildlife species for our country.

Private Landowner Assistance Program

Among the many responsibilities of regional wildlife diversity biologists is providing technical assistance to private landowners. Private landowners are targeted to better manage their properties for wildlife diversity, and in particular, for the Species of Greatest Conservation Need.

Regional wildlife diversity biologists work with landowners at no charge and discuss how their land can better be managed for species of concern as well as overall wildlife diversity. A management plan is also provided to the landowner with details on how to achieve their management goals.

Through the program in 2014, regional wildlife diversity biologists:

- ***Produced 95 written management plans to enhance conservation practices for Species of Greatest Conservation Need on 15,061 private acres. This included grasslands (1,143 acres), agricultural land (491 acres), forest (10,697 acres), early successional habitat (1,201 acres), wetlands (1,586 acres) and riparian corridors (26.3 miles).***
- ***Documented implementation of 11,976 acres of private lands habitat improvements since 2005.***

Regional wildlife diversity biologists assisted landowner Brian Kosglow of Westmoreland County with 75+ acres of shrub/old field habitat with very little structural diversity and a lot of invasive plants. He mowed the shrubs to create openings that could be used as a singing area for American woodcock (the area is low-lying and wet) and has also begun treating invasive plants.

Yellow-bellied flycatcher by Dominic Sherony, Wikicommons

Rare Mountain Forest Birds Project

Our state is the southernmost outpost for a few northern bird species that prefer boreal conifer habitat dominated by spruce and hemlock. Extant boreal forests are found primarily on glaciated parts of the Allegheny Plateau and are relicts of former boreal forests that were once more extensive, but were cut or fragmented in the last two centuries. Both the yellow-bellied flycatcher and the blackpoll warbler (as well as other rare boreal forest birds) can be found breeding in Pennsylvania's remaining boreal forest in very small numbers, most often in mossy areas of swamps and bogs. Populations of both are small enough that they qualify as state endangered.

Staff biologists have been studying these unique populations for several years, primarily at State Game Lands 57, which include Coalbed Swamp in Wyoming County and Boulder Swamp in Luzerne County. Surveys at these sites found at least six yellow-bellied flycatcher and six blackpoll warblers territories at Coalbed Swamp, with four of the flycatcher territories known to have produced young. Boulder Swamp was the location of a blackpoll warbler nest, only the third nest ever to be found in the state. This find also represents a recent expansion into another boreal swamp in State Game Lands 57, demonstrating the colonizing capacity of the species and the good quality of habitat Pennsylvania offers. A conifer swamp in Sullivan County, part of Loyalsock State Forest, was also home to a territorial male yellow-bellied flycatcher, where this species has been found breeding most years since 1990.

Known nesting sites are protected by the agencies that own the properties where these birds are found. Wildlife Diversity staff have also been including spruce forest management strategies into their State Game Land plans. Despite challenges, there are many reasons for the boreal forest birds and their habitat to have a bright future over the next several years.

Bird Communities on Marcellus Shale Sites

Photo Paul Zeph through SlideShare

Pennsylvania has a long history of oil and gas development that dates back to the first oil wells in 1859. With the recent access to the gas reserves of the Marcellus Shale formation underneath a large portion of the northern half and southwestern corner of the state, a surge in drilling on public and private lands for energy development has taken center stage. The ability to access deep natural gas pockets through a process known as hydraulic fracturing has opened up these new areas to energy development, and is bringing industrial-scale energy exploration to remote areas. The large block of core northern forest where recent drilling is occurring is home to many of the Species of Greatest Conservation Need. Researchers from Pennsylvania State University recently completed a 3-year study to quantify the effects that current gas extraction methods have on bird communities in northern Pennsylvania forests. Funding for this study was made possible through grants from State Wildlife Grants, DCNR Wild Resources Program and the Heinz Endowments.

A Marcellus Shale well pad site in Tioga County (above) shows the infrastructure needed for gas development and fragmentation of core forest. Research on bird communities shows that the forest surrounding the developed site attracts disturbance-tolerant species, such as the American robin and displaces forest interior birds species such as the black-throated green warbler (below).

Photo Jacob Dingel, PGC

Researchers studied the avian community associated with Marcellus gas-drilling sites at a seven-county area in Northern Pennsylvania. Thirty Marcellus gas pad sites in both northern hardwood and mixed oak forests as well as on public and private lands, were studied.

Researchers found that the development of a gas drilling site alters the avian community of that area. Although a man-made opening in the forest has the potential to create early successional habitat for Species of Greatest Conservation Need such as the golden-winged warbler, this did not occur. Instead, the guild of birds that are known to tolerate human disturbance, such as the American robin and brown-headed cowbird took advantage of the newly formed opening and were found in higher numbers in the immediate area near the well pad sites. As expected, those birds that typically prefer forested habitat, such as the black-throated green warbler, red-eyed vireo, and ovenbird, were more abundant at sites that were furthest away from the edge of the developed site. This was due both to the immediate loss of habitat, but also likely due to the avoidance of forested habitat near the edge of the drill site.

Gas development is still in its early phases, and only 35% of currently permitted sites in that area have been drilled, with new permitting expected in the future. Therefore, it is expected that there will be a continued loss of core forested habitat and with it a unique array of bird species in northern forests. Drilling in northern forests involves not just the well pad site itself, but the development of roads and the infrastructure that typically accompanies it. Although the majority of well sites are on private lands, there is some development within public lands, where the potential for mitigation is greater. The researchers make several land management suggestions to ameliorate the effects of development of gas well sites on forest bird communities.

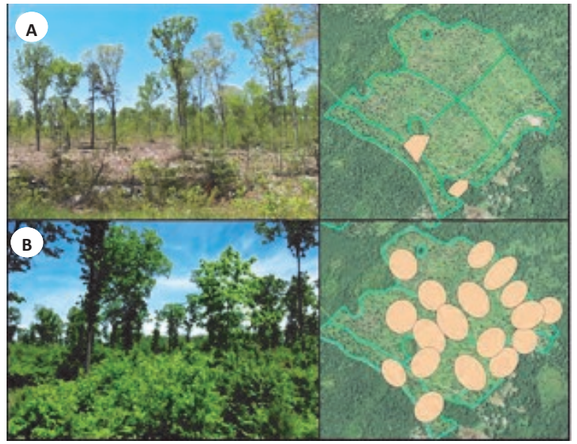
Golden-Winged Warblers Benefit From Regional Work

Photo Wayne Laubscher, PGC

The Game Commission and its partners have become leaders in golden-winged warbler conservation in the Appalachian Mountains. Game Commission staff have cooperated with the Cornell Laboratory of Ornithology, Indiana University of Pennsylvania-Research Institute (IUP-RI) and many others in the Golden-Winged Warbler Conservation Initiative in a comprehensive strategy to monitor, manage experimental habitat and research the birds on both public (including State Game Lands) and private lands.

Survey monitoring protocols developed by the Cornell Laboratory of Ornithology are part of a regional effort to track golden-winged warbler populations and are targeted in areas with favorable habitat for this species. Surveys in 2014 included 171 points statewide and detected 21 golden-winged warblers, 41 blue-winged warblers and 6 hybrid species. These surveys have documented a steady decline in golden-winged warbler numbers as well as a retraction of their range in Pennsylvania and an increase in blue-winged warblers and their hybrids. This monitoring has informed our research and management strategies enough to recover the golden-winged warbler in the state.

Several partners are also working together to implement Best Management Practices on public lands as a next step in conservation. Researchers at IUP-RI are working with foresters who are specifically preparing properties for quality young-forest habitat for the golden-winged warbler and other priority-conservation species, such as ruffed grouse, American woodcock, eastern whip-poor-will and prairie warbler. Through 2014, project foresters have prepared 4,433 acres in 114 stands for golden-winged warbler Best Management Practice implementation on 21 State Game Lands and other properties. Preliminary research by IUP-RI has shown that golden-winged warblers respond quickly and positively to these changes in habitat and this data will help inform further management.



Best Management Practices were implemented to enhance habitat for golden-winged warblers and other early-successional species. Picture A shows the site immediately after treatment with golden-winged warbler territories in tan in the adjacent photo on the right. Photo B shows the same site, 3 years later with the increase in golden-winged territories in tan circles in the adjacent photo.

In another partnership with the Game Commission, IUP-RI, Pheasants Forever, National Wild Turkey Federation, Appalachian Mountain Joint Venture, and the National Fish and Wildlife Federation, quality young forest habitat was created on private lands through the Natural Resource Conservation Service's Working Lands For Wildlife Program. In 2014, a total of 23 golden-winged warbler projects involving over 1,000 acres of land were created in Pennsylvania and accounted for more than 77% of all golden-winged warbler breeding habitat acres enrolled across the 9 Appalachian states participating in this program. In the first three years of the Working Lands for Wildlife Program, our partnership enrolled a total of 6,795 acres belonging to 141 private land owners, accounting for 81% of all acres enrolled across these same states. The Natural Resource Conservation Service's Conservation Effects Assessment Program has provided funding for monitoring the results of these efforts, and that research is ongoing.

Tony Ross/PGC Photo

Barn Owl Conservation Initiative

Barn owls are an efficient pest control species, consuming small rodents on farmland habitat wherever they are found. As its name implies, the barn owl commonly nests in barns or silos, but also other artificial nest sites such as abandoned buildings or nest boxes. They are currently considered a Species of Greatest Conservation Need, based on trends from several population surveys. Their decline is believed to be in part due to the change to more 'clean' farming practices, which has eliminated the vegetative cover needed for their preferred food source, as well as the loss of secure nesting sites.

The Barn Owl Conservation Initiative seeks to reverse the decline of this species through monitoring, assistance with habitat management, and education programs. This ongoing effort compiles information on where barn owls currently exist, including nest sites and incidental occurrences. When a new occurrence is reported, a landowner is given information on how they can help with barn owl conservation, such as by providing secure nesting locations as well as maintaining appropriate foraging habitat. Barn owl adults and nestlings are also banded when feasible to gather information on longevity, causes of mortality and dispersal.

Regional wildlife diversity biologist Rich Fritsky and one of the barn owls he banded.

Through the Barn Owl Conservation Initiative in 2014, regional wildlife diversity biologists:

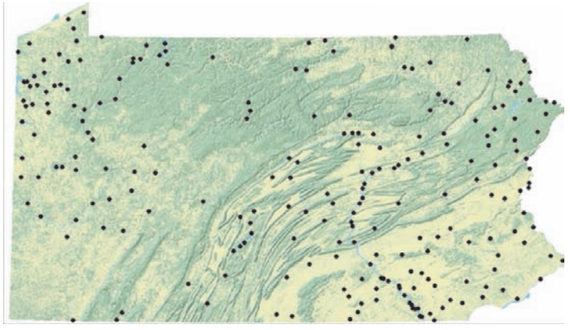
- ***Monitored known nest sites and searched for new nest sites. Fifty-seven active nests were found, bringing the total of confirmed nests sites to 195 since the program began in 2005.***
- ***Distributed and/or installed barn owl boxes. With the assistance of volunteers, 57 barn owl boxes were installed at appropriate locations with the cooperation of landowners. Eighty-two percent of confirmed nest sites were in boxes specifically installed for barn owls.***
- ***Conducted outreach to engage and inform land-owners. Biologists facilitated several symposia and presentations to both professionals and the public on the Initiative.***
- ***Banded 177 barn owls at 47 different locations. Since the program began, 87 banded barn owls have been recovered. The furthest recovery to date was a bird banded in Lebanon County and recovered in the Bahamas.***

Bald Eagle Population Continues to Thrive

A true success story of modern wildlife management, the bald eagle became the first species removed from the state's endangered and threatened species list in January of 2014. Its historic decline from pesticides and poor water quality in the first half of the 20th century resulted in a low of 3 nesting pairs statewide by 1983. A reintroduction program by the Game Commission and many others has returned this iconic symbol to a thriving state population. Game Commission staff and volunteers continue to facilitate the monitoring of bald eagles through the breeding season and with an annual mid-winter survey.

There are now bald eagle nests in 59 Pennsylvania counties, with Crawford, Lancaster, York, Pike, Mercer and Tioga counties accounting for the most nesting pairs. During the 2014 breeding season, 275 nesting pairs were identified, with 26 of those pairs in new territories. Because the nesting population has grown so large, it has become difficult for agency staff to monitor all active nests and it is likely that the population is much larger than those numbers.

More eagle pairs are also being found in urban and suburban areas. An apparent tolerance for humans and overall habitat improvements are likely driving the increased proximity to human populations. As this trend continues, proactive educational efforts by the Game Commission and other agencies are necessary to inform the public about proper "eagle etiquette" around nest sites to prevent nest abandonment and failure. As the population grows, bald eagles will likely begin to expand and colonize other parts of the state.



Map above shows the location of active bald eagle nesting sites in 2014. The highest concentrations of nests were in Crawford, Lancaster, York, Pike, Mercer and Tioga counties.

In cooperation with several partners, a live-feed HD video camera was installed at an active bald eagle nest at Codorus State Park in Hanover, PA in December 2014. This extremely popular site attracted nearly 1.5 million unique viewers during late winter and spring of 2015. These viewers were able to watch the complete cycle of nest building to hatching and fledging of young in real time. The pair of eagles ultimately fledged two young from the nest in June 2015. Many organizations and individuals posted stories, observations and photographs of the nest in social media both within and outside of the state, and in over 200 countries, showcasing the agency's successful education outreach.

Mid-Winter Bald Eagle Survey

Each January, the Mid-Winter Bald Eagle Survey is coordinated locally by the Game Commission and nationally by the Army Corps of Engineers. Following national guidelines, 75 volunteers helped complete the annual survey for the 24th year in a row. During those surveys, 265 eagles were found in 35 counties. Bucks and Lancaster counties recorded the highest eagle numbers.

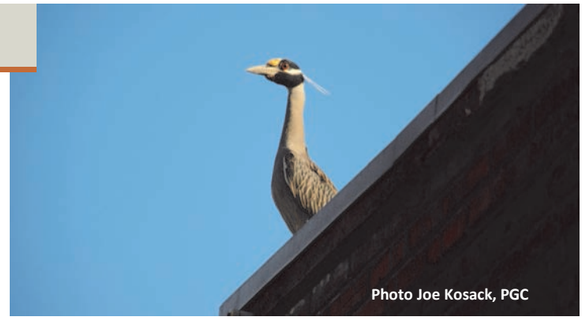
This survey provides many important benefits to monitoring of bald eagle populations in Pennsylvania. Participants can record eagles building new nests or refurbishing established nests while visibility is still good. The surveys also increase public participation and appreciation for the bald eagle, improving the long-term outlook for bald eagles in Pennsylvania.

Wetland Nesting Bird Surveys Introduced

Secretive and rare wetland birds were the focus of a survey initiated by the Wildlife Diversity Division for the 2014 breeding season. Targeted species included the pied-billed grebe, American bittern, least bittern, black rail, king rail, Virginia rail, sora, common moorhen, and American coot. All of these Species of Greatest Conservation Need can be found breeding in wetland areas and many are state threatened or endangered. The objective of these surveys is to create a long-term monitoring database of these species in their associated wetland habitat.

Wetland areas between 3-10 hectares in size were identified from a National Wetland Inventory Map and targeted for the surveys. Volunteers were recruited from several online sites, state and private organizations, and local bird clubs to assist with the surveys. Participants were able to identify, reserve and survey a wetland site and later enter all data online using an ArcGIS Online Interface that was developed specifically for these surveys. An audio playback protocol adapted from the Standardized North American Marsh Bird Monitoring Protocols was used and was similar to that used in the 2nd Pennsylvania Breeding Bird Atlas.

During the summer of 2014, a total of 275 wetlands in 38 counties were evaluated for suitable bird habitat; of those, 228 wetlands in 11 counties were ultimately chosen for surveys (47 sites were determined as unsuitable for nesting birds). Although there were 9 target species, only 6 were located by the playback surveys, and all in very low numbers. Total detections of each species were 1 least bittern, 5 sora, 30 Virginia rail, 3 American bittern, 1 common moorhen, and 2 pied-billed grebe.



This yellow-crowned night-heron (PA endangered) was part of a small colony of birds that nested in downtown Harrisburg in 2014. They are typically found in urban landscapes in Pennsylvania.

Colonial Nesting Bird Surveys

Three state endangered birds, the great egret, yellow-crowned night-heron and black-crowned night-heron are considered 'colonial nesters' because a breeding population will cluster its nests together in one location, forming a colony. This strategy can be helpful in protecting against predators (more eyes for defense), but can also make these birds more susceptible to human disturbances and natural disasters. These 3 rare water bird species are only found at a few urban and suburban sites in limited numbers and are monitored annually by biologists and volunteers.

The annual survey at Wade Island in Dauphin County identified 131 great egret and 55 black-crowned night-heron nests, the largest concentration of each species known in the state. At Kiwanis Lake in York County, 17 great egret nests were counted. Black-crowned night-herons were also found at 4 other colonies in the southeastern part of the state, increasing their numbers by 41% from 2013 to 2014. A total of 19 yellow-crowned night-herons nests were found in three different sites near Harrisburg, a modest improvement in their population numbers from the previous year.

The king rail (left; PA endangered) was one of the targeted species for the initial Wetland Bird Surveys in 2014. Although only 42 total targeted birds were counted (with no king rail), the results of this first Wetland Bird Survey are preliminary. The surveys will be repeated in the 2015 season focusing on larger wetlands, although survey work will continue in the smaller and medium-sized wetlands.

Contributing to Conservation Through Citizen Science

Citizen Science capitalizes on the enthusiasm and abilities of many talented birdwatchers and amateur naturalists throughout the state to partner with scientists to collect necessary data. Volunteers assist the work of wildlife biologists with the many monitoring programs that require significant data collection. Although not all projects will be suitable for public participation, those that are give biologists the ability to turn their attention to more complex issues. In return, citizen naturalists gain a better understanding of the scientific process and the satisfaction of adding to the knowledge of the natural world.

Rusty Blackbird Spring Blitz

Experiencing one of the most drastic declines of any forested bird over the past decade, the rusty blackbird nests in the boreal forests of Canada but migrates through Pennsylvania. Because it resembles other "blackbirds," it tends to be overlooked and misidentified and is poorly monitored by standard protocols. Because of population declines it is now considered a conservation -priority species by the U.S. Fish and Wildlife Service and others. For a better understanding of its migration patterns and the areas important to it during its migration passage, the Game Commission served as state coordinator of a "Spring Blitz" project. The first rusty blackbird Spring Blitz in 2014 was a big success. With 742 eBird checklists reporting rusty blackbirds, Pennsylvania was seventh on the list of the states and provinces with the highest number of reports. This blitz showed that rusty blackbirds visit the state in a variety of locations, sometimes in good numbers. Blitz data will assist researchers in developing strategies to halt declines, protect remaining populations, and restore their numbers.

Rusty Blackbird, Wikicommons Photo

Absent as nesting birds from the mid-1990s through 2012, a highlight of 2014 was two nesting common tern (PA endangered) pairs in the Gull Point Natural Area at Presque Isle State Park in Erie County. Unfortunately, both nests were depredated before hatching. A small number of piping plovers (federally endangered, PA extirpated) were also observed using the site during migration. These advancements in Pennsylvania shorebird conservation would not be possible without active management of invasive plant species and a strong partnership between the Game Commission, DCNR, Audubon Pennsylvania, Western Pennsylvania Conservancy and the U.S. Fish and Wildlife Service.

The Pennsylvania Birdwatching Community Contributes to Science Through eBird

The Cornell Laboratory of Ornithology launched the eBird program in 2002 as a global initiative to provide a real-time, online checklist program for recreational and professional birdwatchers. Through eBird, a birdwatcher is able to submit their birding checklist into an online database. These can then be summarized with others to inform scientists and non-scientists about bird populations in both time and space. Birders can keep track of their own checklists and scientists, educators, and land managers can also access this data for an increased understanding of bird movements and distributions both locally and around the globe.

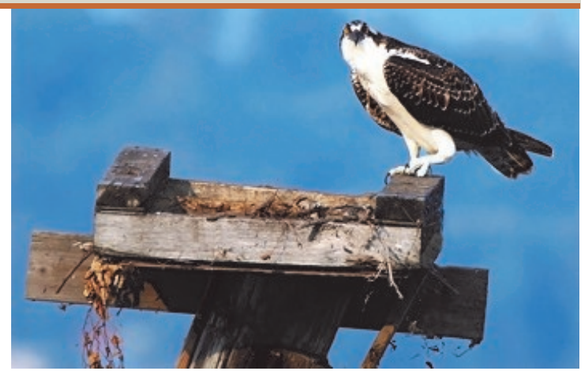
In 2014, 123,619 individual field-trip reports from Pennsylvania were entered into eBird, an 11% increase over the previous year. The Pennsylvania eBird site posted 20 stories to engage and inform the birding public who contribute to our common knowledge of birds and is a great site to find interesting local articles about birds, conservation issues and birding events occurring throughout the state.

Peregrine Falcon and Osprey Populations Grow

The peregrine falcon disappeared from Pennsylvania by 1960 due to years of reproductive failure linked to an overuse of pesticides such as DDT. A reintroduction program initiated during the 1970s by several organizations, including the Game Commission, helped reestablish this population into the wild. The long-term goal of the Game Commission's peregrine falcon recovery and management program is to re-establish a self-sustaining population of peregrine falcons in Pennsylvania. Although federally delisted in 1999, the peregrine falcon remains on the state endangered list. It is anticipated that continued success in the recovery program will lead to an upgraded status of 'threatened' in the near future, as specified in the state management plan.

Agency staff, cooperating agencies, and over 200 volunteers monitored peregrine falcons at 60 suspected nesting sites throughout the state in 2014. Pairs ultimately occupied 43 sites; the highest number since the beginning of the peregrine falcon recovery program. The falcons were also documented using their historic nesting sites on large rocky cliffs in larger numbers in 2014. Of those nests that were located and monitored, 56% were successful and those pairs produced 70 fledglings (an average of 1.63 per nest), which exceed the criteria for a recovering population. The Game Commission will monitor this population to ensure that this trend continues.

As with the peregrine falcon, the osprey is at the center of a successful reintroduction program that began in 1980. Although the osprey is currently listed as a state threatened species, the population is also growing to a point of possible upgraded status in the near future. The current population is monitored through a combination of staff and volunteer observations and eBird reports.



Continued growth of both osprey (above) and peregrine falcon populations in Pennsylvania should lead to a more secure status for each species in the near future.

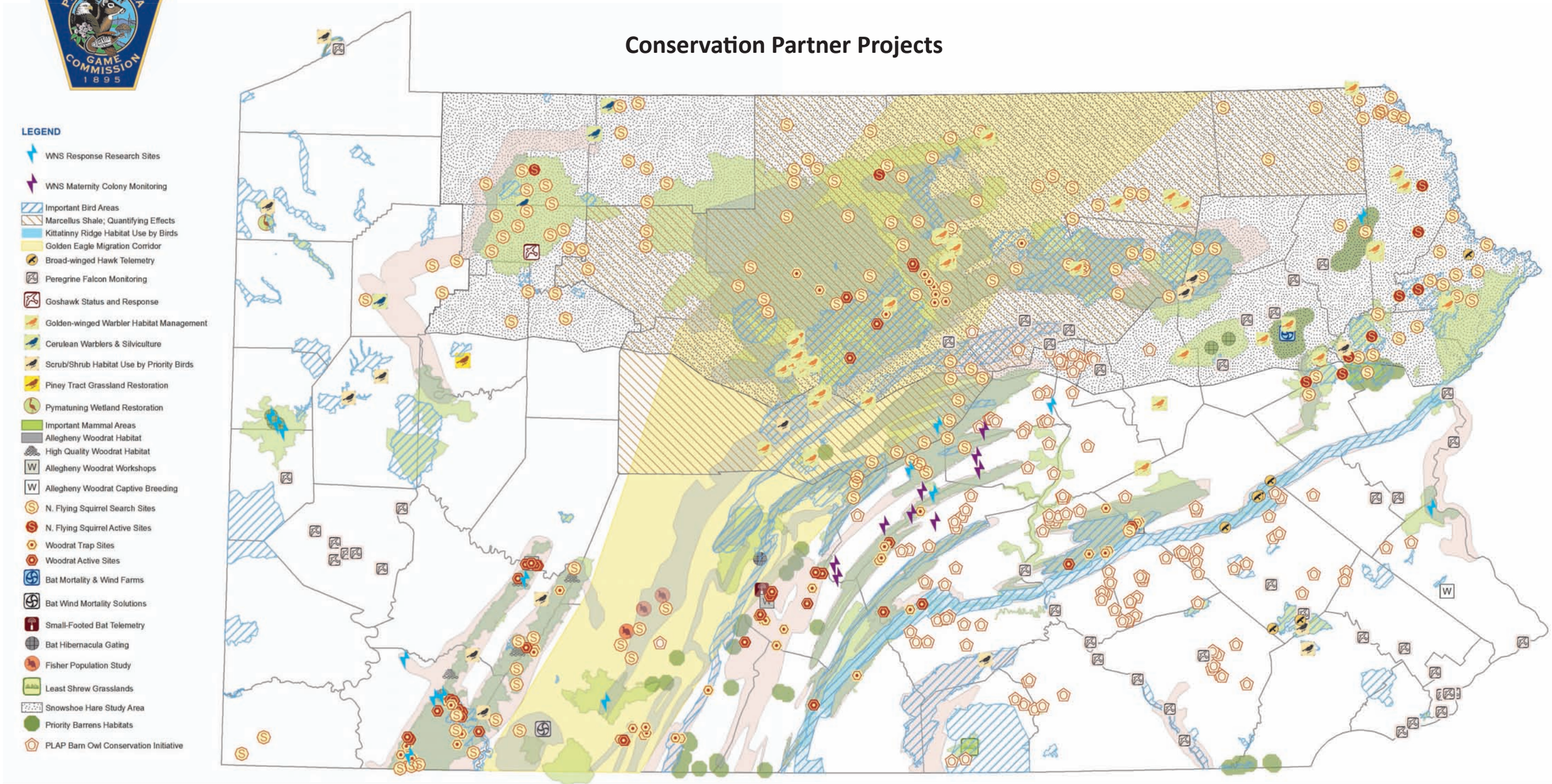
During the 2014 breeding season, 83 active osprey nests were identified in 20 different counties. Nearly all nests were associated with human-modified habitat either near rivers, lakes and reservoirs, or built on a man-made structure, and often both. Although nest observations were collected only opportunistically, these data are helpful to evaluate osprey recovery in the state.

The recently completed draft of the 2015-2025 Osprey Recovery and Management Plan establishes recovery goals that will provide for delisting of this species. Recommendations include achieving population targets for breeding pairs, protection of the osprey and its habitat, as well as public outreach to improve understanding and appreciation of the osprey. Meeting these goals should ensure that Pennsylvania's population is sufficiently large and widely distributed to be resilient enough to survive natural population cycles. This will also justify the reclassification of osprey from threatened to secure or recovered in Pennsylvania.

Photo Art McMorris, PGC

These peregrine falcon chicks (left) were from a nest inside a box beam at the Delaware River Bridge in Bucks County in May, 2014. Each chick (ages range from 14-17 days old) was banded with a unique band. This nest represents a large brood, and 4 chicks is more typical.

Conservation Partner Projects



State Wildlife Grants support the work of the Wildlife Diversity Program's endangered bird and mammal specialists, regional wildlife diversity biologists, Private Landowner Assistance Program, Barn Owl Conservation Initiative and Acoustic Survey for Bats. Equally important, the Game Commission works with conservation partners across the state and region to bring special expertise and local commitment to projects and maximize the impact of these federal dollars.