

**PENNSYLVANIA GAME COMMISSION
BUREAU OF WILDLIFE MANAGEMENT
PROJECT ANNUAL JOB REPORT**

PROJECT CODE NO.: 06723

TITLE: Wetland Research/Management

JOB CODE NO.: 72302

TITLE: Wetland Nesting Bird Surveys

PERIOD COVERING: 1 January 2014 to 31 December 2014.

WORK LOCATIONS: State-wide with emphasis on wetlands between 3-10 hectares.

PREPARED BY: Alison Fetterman and Patricia M. Barber

DATE: 24 February 2015

COOPERATING AGENCIES AND ORGINIZATIONS: Audubon Pennsylvania, Pennsylvania Biological Survey Ornithological Technical Committee, Cornell Laboratory of Ornithology, Pennsylvania Society for Ornithology, Fort Indiantown Gap, Pennsylvania Department of Conservation and Natural Resources and volunteers across Pennsylvania.

ABSTRACT Almost all Pennsylvania wetland birds have declined in recent decades as documented recently by the Second Atlas of Breeding Birds in Pennsylvania and the agency's surveys. A majority of bird species listed as state endangered and threatened in Pennsylvania breed in wetlands. During 2014, wetlands greater than 3 hectares were identified from the current National Wetland Inventory map and mapped for registered observers through an ArcGIS Online interface. The marsh bird survey focuses on secretive nesting marsh birds including: pied-billed grebe, American bittern, least bittern, black rail, king rail, Virginia rail, sora, common moorhen, and American coot. Surveys were conducted between 15 May and 30 June 2014 using an audio playback protocol adapted from the Standardized North American Marsh Bird Monitoring Protocols (Conway 2009) and very similar to that used in the Second Pennsylvania Breeding Bird Atlas (Lanzone et al. 2006). A large volunteer effort to survey these 1,500 wetlands between 3-10 hectares in size state-wide was initiated for the 2014 season, resulting in 275 wetlands being evaluated, and 228 were surveyed, in 38 counties by 10 volunteers and Pennsylvania Game Commission staff. This survey is to be repeated in the 2015 season focusing on larger wetlands and continue surveys in the medium-sized wetlands, so results of this report are preliminary.

OBJECTIVES

1. Inventory and monitor 9 species of wetland nesting birds in Pennsylvania, focusing on smaller wetlands between 3-10 hectares in size. Species surveyed included avian species of

greatest conservation need (SGCN) in the Pennsylvania Wildlife Action Plan, including endangered and threatened species.

2. Engage and educate the public about our SGCN wetland birds and how they can help monitor and protect these species for the enjoyment of future generations and the functioning of our ecosystems.

3. Use an ArcGIS Online interface for wetland identification and online data entry.

4. Provide protection of exceptional wetlands and better inform management of the state's wetlands for sustaining populations of wetland-dependent species, especially those that are designated as SGCN in the Pennsylvania Wildlife Action Plan.

METHODS

This marsh bird monitoring protocol is adapted from the Standardized North American Marsh Bird Monitoring Protocols (Conway 2009), previous Wildlife Diversity marshbird surveys (Brauning and Van Fleet 2006), and very similar to that used in the Second Pennsylvania Breeding Bird Atlas (Lanzone et al. 2006). These are playback surveys that can improve our understanding of the statewide distribution and relative abundance of these rare birds (Conway 2009). The adapted protocol was available to the public on a Pennsylvania Game Commission (PGC) website. Volunteers were recruited through PABIRDS Listserve, Pennsylvania eBird, state and private organizations, and local bird clubs.

Wetlands were identified from the current National Wetland Inventory map layer. Various emergent types were aggregated in simplify classification; resulting in 1,571 emergent wetlands from 3-10 hectares across Pennsylvania. Registered observers were directed to the ArcGIS Online interface created for this project by the Game Commission staff. The interface allowed users to easily identify, reserve, and survey wetland locations via a computer or mobile device. Volunteers each selected wetland survey locations and entered all data online individually, through the ArcGIS interface.

Target species include American bittern (*Botaurus lentiginosus*), least bittern (*Ixobrychus exilis*), pied-billed grebe (*Podilymbus podiceps*), sora (*Porzana carolina*), king rail (*Rallus elegans*), black rail (*Laterallus jamaicensis*), Virginia rail (*Rallus limicola*), American coot (*Fulica americana*), common moorhen (*Gallinula chloropus*). Other conservation priority species or wetland indicators that may be encountered include marsh wren (*Cistothorus palustris*), sandhill crane (*Grus canadensis*), willow flycatcher (*Empidonax trailli*), Wilson's snipe (*Gallinago delicata*), wood duck (*Aix sponsa*), green-winged teal (*Anas crecca*), blue-winged teal (*Anas discors*), osprey (*Pandion haliaetus*), and bald eagle (*Haliaeetus leucocephalus*) and could be recorded in a notes section.

Surveys were conducted between 15 May and 30 June either in the morning or the evening, when marsh birds are most detectable (Conway 2009). Morning surveys were conducted anytime in the period from first light (30-45 minutes before sunrise) to 3 hours after sunrise. Evening surveys were conducted in the period from 3 hours before sunset to dark (30-45 minutes after sunset).

The audio playback is 14 minutes in length, starting with a 5 minute silent period followed by 30 seconds of each species calls and 30 seconds of silence between each species. During each survey, observers record species heard during the playback period, as well as record the percent of open water, floating vegetation, cattail, sedge or rush, *phragmites*, woody, and other vegetation within 100 meters from the edge of the survey point. Weather such as cloud cover, temperature and wind were also recorded.

Essentially all wetland birds of conservation priority have declined in recent years, so the agency has been involved with research, management, and education about this habitat's species for many years. Species accounts of these species that document these declines and their threats are available in 2 publications, the Terrestrial Vertebrates of Pennsylvania (Steele et al. 2010) and the Second Atlas of Breeding Birds in Pennsylvania (Wilson et al. 2012). A summary of Pennsylvania wetland bird communities is offered elsewhere by the PGC in a publication of the Pennsylvania Academy of Sciences (Gross and Haffner 2010). The decreased quantity and quality of wetland habitats, invasive plant species, and their isolation from each other are among the reasons cited for species declines. These publications set the stage for cooperation between the agency and other interested parties.

RESULTS

In 2014, between 15 May and 30 June, 275 wetland locations were evaluated for suitable marsh bird habitat in 38 counties; Adams, Allegheny, Berks, Blair, Bradford, Bucks, Butler, Cambria, Centre, Chester, Clearfield, Crawford, Dauphin, Delaware, Erie, Huntingdon, Jefferson, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Lycoming, Mercer, Monroe, Northampton, Pike, Potter, Schuylkill, Somerset, Sullivan, Susquehanna, Tioga, Warren, Washington, Wayne, Westmoreland, and Wyoming. There were 228 wetland sites surveyed using the protocol for the 9 target marsh bird species and the remaining 47 sites were determined to be unsuitable habitat for the target species and therefore not surveyed (Fig. 1).

Six of the target marsh bird species were detected at 22 of the 228 surveyed locations in 11 counties (Table 1). Total detections of each species are: black rail, 0; least bittern, 1; sora, 5; Virginia rail, 30; king rail, 0; American bittern, 3; common moorhen, 1; American coot, 0; and pied-billed grebe, 2.

Least bittern were detected in 2 additional locations outside of the playback period of the protocol. One individual was observed in Delaware County at a known breeding location and 1 individual was observed in Lebanon County.

As part of our strategy to involve and educate the public about wetland bird species, the agency developed pages on its website about its endangered and threatened bird species and its plans for wetland bird surveys in 2014 and 2015. The 2014-2015 marsh bird surveys web pages were visited 388 times (Table 2). Twenty-seven volunteers registered as observers and 10 were able to conduct surveys. A total of 275 wetland locations were evaluated in 38 counties.

Web pages for endangered and threatened wetland species are hosted on the PGC's website and include American bittern, least bittern, common tern, black tern, king rail, sedge wren, northern harrier, and short-eared owl. Each page includes status, population trend, identifying characteristics, biology, natural history, preferred habitat, management programs, and supporting literature. During 2014 these pages were viewed 31,188 times (Table 2). The target audience for these pages is educators, students, and adults interested in wildlife and conservation. In addition, a story was written for publication in the Pennsylvania Game News about wetland bird surveys and a research note was published there about bitterns.

RECOMMENDATIONS

1. Establish a long-term monitoring database of wetland birds.
2. In 2015 continue conducting wetland surveys for marshes 3-10 hectares as well as traditionally surveyed wetlands greater than 10 hectares.
3. Repeat wetland bird surveys at least every 4 years. The next survey is planned for 2015.
4. Include management and conservation of wetland birds of conservation priority in comprehensive game lands management plans.
5. Monitor the presence and extent of non-native invasive plant species (particularly purple loosestrife).
6. Work with other organizations to monitor, conserve, and manage wetland birds that are especially vulnerable due to their rarity, isolation and secretive nature.
7. Increase participation of the public in organized surveys and less formal monitoring projects like Pennsylvania eBird and increase the quality of those reports by educating the users about the use of eBird features like photographs, detailed notes, and breeding codes that increase the credibility and utility of these reports.
8. Continue and expand engagement and education of the public concerning wetland birds and their habitats.
9. Evaluate wetlands outside of the survey period to determine if the habitat is suitable, in order to more efficiently use the short survey period during the breeding season.
10. Develop wetland Best Management Practices (BMPs) to clearly identify practices appropriate to the long-term persistence of rare marsh bird species.

LITERATURE CITED

Brauning, D. and K. Van Fleet. 2006. Wetland Nesting Bird Surveys. Annual Report, Final Job Report No 72302, Pennsylvania Game Commission, Harrisburg, USA.

- Conway, C. J. 2009. Standardized North American Marsh Bird Monitoring Protocols, version 2009-2. Wildlife Research Report #2009-02. U.S. Geological Survey, Arizona Cooperative Fish and Wildlife Research Unit, Tucson, USA.
- Gross, D. A. and C. D. Haffner. 2010. Wetland bird communities: boreal bogs to open water. Pages 44-61 *in* S. K. Majumdar, T. L. Master, M. C. Brittingham, R. M. Ross, R. S. Mulvihill, and J. E. Huffman, editors. *Avian Ecology and Conservation: A Pennsylvania focus with national implications*. The Pennsylvania Academy of Science, Easton, USA.
- Lanzone, M. J., R. S. Mulvihill and T. M. Miller. 2006. Second Pennsylvania breeding bird atlas marsh bird survey protocols. Powdermill Avian Research Center, Rector, Pennsylvania, USA.
- Steele, M. A., M. C., Brittingham, T. J. Maret, and J. F. Merritt, editors. 2010. *Terrestrial Vertebrates of Pennsylvania: A Complete Guide to Species of Conservation Concern*. Johns Hopkins University Press, Baltimore, Maryland, USA.
- Wilson, A. M., D. W. Brauning, and R. S. Mulvhill, editors. 2012. *Second Atlas of Breeding Birds in Pennsylvania*. Pennsylvania State University Press, University Park, USA.

Table 1. Counties and total detections of marsh bird species during 2014 marsh bird surveys.

County	American bittern	Common moorhen	Least bittern	Pied-billed grebe	Sora	Virginia rail
Adams						
Allegheny						
Berks						
Blair						
Bradford						
Bucks						
Butler						
Cambria						
Centre						1
Chester						4
Clearfield						
Crawford			1	2		3
Dauphin		1				
Delaware						
Erie						
Huntingdon						
Jefferson					1	2
Lackawanna						
Lancaster						
Lebanon					3	
Lehigh						1
Luzerne						
Lycoming						
Mercer						
Monroe						
Northampton						
Pike						
Potter						
Schuylkill						
Somerset						
Sullivan						
Susquehanna	2					3
Tioga	1					15
Warren						
Washington					1	
Wayne						1
Westmoreland						
Wyoming						

Table 1. cont.

County	American bittern	Common moorhen	Least bittern	Pied-billed grebe	Sora	Virginia rail
Total	3	1	1	2	5	30

Table 2. Wetland nesting bird web pages downloaded during 2014.

Common name	Scientific name	Status	Downloads
American bittern	<i>Botaurus lentiginosus</i>	Endangered	5083
black tern	<i>Chidonias niger</i>	Endangered	2955
common tern	<i>Sterna hirundo</i>	Endangered	2621
king rail	<i>Rallus elegans</i>	Endangered	4650
least bittern	<i>Ixobrychus exilus</i>	Endangered	2885
sedge wren	<i>Cistothorus platensis</i>	Endangered	2826
short-eared owl	<i>Asio flammeus</i>	Endangered	6264
northern harrier	<i>Circus cyaneus</i>	Threatened	2688
wetland annual reports			643
marsh bird survey protocol			388
Total			32219

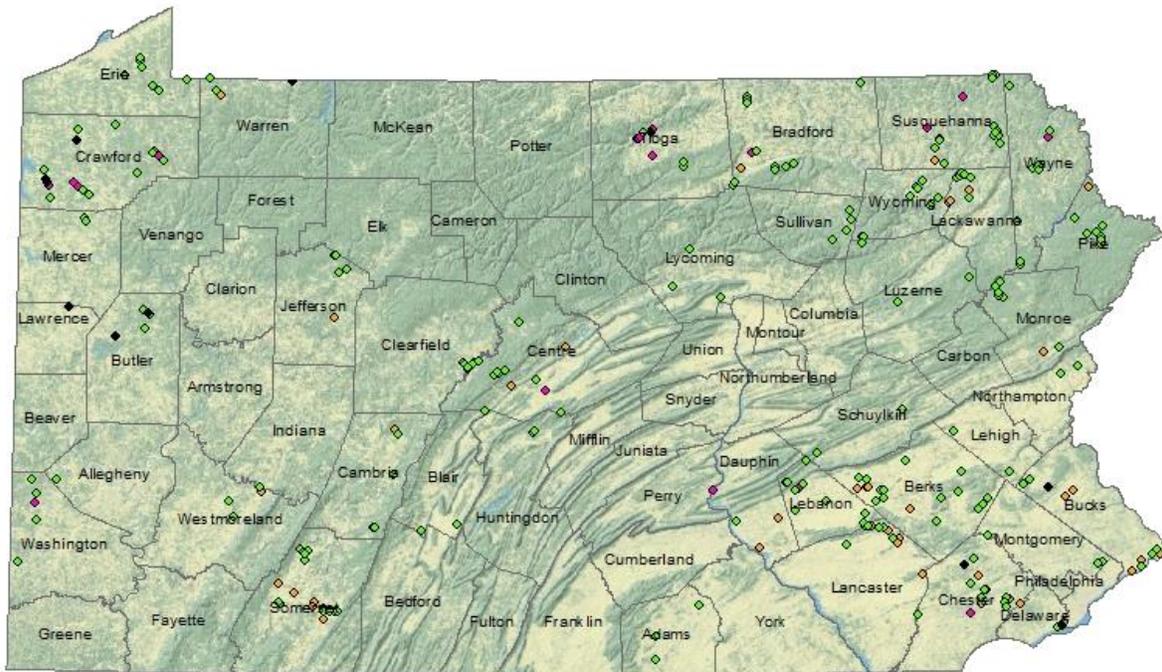


Figure 1. Marsh bird surveys and site evaluations completed in 2014 and 2015 survey priorities. Sites surveyed ●, marsh birds detected ●, site not suitable for surveys ●, 2015 priority sites ●.