

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

PROJECT CODE NO.: 06711

TITLE: Bald Eagle Research/Management

JOB CODE NO.: 71101

TITLE: Bald Eagle Breeding Surveys

PERIOD COVERED: 1 July 2016 to 30 June 2017

COOPERATING AGENCIES AND ORGANIZATIONS: U.S. Department of the Interior, U.S. Fish and Wildlife Service; U.S. Army Corps of Engineers; Delaware Water Gap National Recreation Area; U.S. Department of Agriculture, Allegheny National Forest; the Eagle Institute; Audubon Pennsylvania staff and volunteers; Department of Conservation and Natural Resources; Pennsylvania Fish and Boat Commission; New Jersey Fish, Game & Wildlife; New York Department of Environmental Conservation; Hawk Mountain Sanctuary Association; Hawk Migration Association of North America; HawkWatch International, Bird Studies Canada; Raptor Population Index project; members of Pennsylvania Society for Ornithology and Delaware Valley Ornithological Club.

WORK LOCATION(S): Statewide

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ABSTRACT The bald eagle was removed from Pennsylvania's list of endangered and threatened species in 2014. This study continues to monitor nesting bald eagles in Pennsylvania. Active breeding territories were reported from a diverse group of sources and a sample of nests was selected to estimate nesting success and productivity. The nesting population has grown to the point where a census is not possible. Of the 89 territories in the productivity sample with known outcomes, 87.6 percent of nests were successful and produced 1.57 fledglings per nest. Strategies identified in The Bald Eagle Management Plan for Pennsylvania (2010–2019) were continued during the year improving and enhancing public understanding, appreciation and viewing of bald eagles. During 2016, eagle related pages on the Pennsylvania Game Commission's web site were viewed over 150,000 times. The camera feed on a Pennsylvania bald eagle nest was enthusiastically viewed by nearly half a million unique viewers. This educational outreach was very successful for the agency's relationship with the public that embraces bald eagles.

OBJECTIVES

1. Assess population of nesting bald eagles in Pennsylvania through annual inventory and monitoring to assure continued recovery during post-delisting period
2. Improve and enhance public understanding, appreciation and viewing of bald eagles, by implement strategies of the bald eagle management plan.

METHODS

Breeding Season

Bald eagle nests were identified and monitored for nesting activity during the 2016 breeding season by a variety of local observers, including Wildlife Conservation Officers, regional biologists, other agency staff, and volunteers. A randomly selected sample of territories active in 2015 (n=185) was monitored more intensively than the population as a whole to determine nesting success and productivity. Behavioral observations were used to estimate incubation, hatch and fledging. Nesting productivity was estimated as the number of young observed in the nest just prior to fledging or fledglings seen in the immediate area. New nests are considered new territories when greater than 1 mile from an established nest. Within a mile, a new nest is considered an additional nest in the original territory, unless both nests are active at the same time. Alternate nests, within an established territory, are identified with the original site name plus a sequential number added to distinguish the nest within the territory. The Pennsylvania Game Commission provides nest data to the U.S. Fish and Wildlife Service for new active bald eagle nests because that agency now has the lead in protecting this species.

Nests from the productivity sample with unknown fates were not assigned an outcome. To determine if the population metrics specified in the bald eagle management plan were met, nesting success and productivity were calculated in 2 manners: assuming all nests with unknown fates either succeeded or failed, thereby providing a maximum and minimum value for the population.

Education and Recreation

Documents on bald eagles hosted on the Game Commission's website include specific information on identification, natural history, nesting biology, the history of bald eagle recovery in Pennsylvania, bald eagle nest etiquette, and finding bald eagles. The target audience for these pages is educators, students and adults interested in wildlife and conservation. These various outreach efforts enable the agency to better engage the public in nest monitoring and bald eagle protection, increasing our effectiveness. Engaging the public in bald eagle monitoring and protection was specifically listed as Goal 4 in the Bald Eagle Management Plan for Pennsylvania. (2010–2019), as “improve and enhance public understanding, appreciation and viewing of bald eagles. The agency specifically engages the public in monitoring and protecting bald eagle nests. The educational products have set the stage for more direct engagement by public.

A bald eagle nest camera provided the public an unprecedented look inside a Pennsylvania bald eagle nest. The area was closed and signs posted to encourage observations without disturbing the nest. The selection of a centrally located Pennsylvania nest was a factor in the popularity of the nest and the camera feed of the nest. This project not only fulfills a strategy of the bald eagle management plan but also the agency's interest in engaging the public with wildlife.

RESULTS

Breeding Season

During the 2016 nesting season, volunteers and staff members contributed observations to monitor bald eagles with 180 volunteers contributing to the effort. The nesting population has grown to the point where a statewide complete census of nests is not possible, (Fig. 1). There were 184 territories included in the productivity sample, 12 of them did not appear to nest. The fate of about half (89) of the remaining nests was determined, of which 87.6 percent of nests were successful, producing 1.57 fledglings per nest. The most conservative estimate, assuming that all nests with unknown results failed, is 45.9 below the 60% goal for delisting (Table 1, Gross and Brauning 2011, U.S. Fish and Wildlife Service 2009), but the results are probably higher. All 19 new nests were reported to the U.S. Fish and Wildlife Service, the agency has the lead for protection of bald eagle nests.

Education and Recreation

Vigilance and public education is needed to maintain the success of eagle nests especially in urban landscapes. Curious on-lookers and photographers are sometimes the most intrusive humans at an active eagle nest. Human infrastructure in place before the nest is built is acceptable to the particular birds. Proactive educational efforts have met with increasing public acceptance and success including signage about “eagle etiquette” discouraging inappropriate human behavior around active nests that disturb eagles and may cause nest failure or abandonment. The Eagle Institute and the Pennsylvania Department of Natural Resources Bureau of State Parks have been educating the public on this same approach to enjoying eagles and limiting disturbance. Such proactive education measures are critical to the continued success of bald eagle recovery and an important part of the agency’s strategy for bald eagles (Gross and Brauning 2011).

Web pages specific to bald eagles were viewed 157,237 times in 2016. The website was moved to a new platform and counts reflect unique IP addresses from July to December. The agency reaches a wide audience effectively, and an educated and understanding citizenship is the best long term protection for eagles, leading to voluntarily avoidance of disturbance and good “eagle etiquette” around nesting areas.

The chances of seeing a bald eagle in Pennsylvania are the best they have been in a 100 years. Enhancing the public’s understanding, appreciation and interest in bald eagles, makes wildlife more available to everyone. The Pennsylvania Game Commission developed educational materials to promote recreational eagle watching and hosts them in the “Bald Eagle Watching in Pennsylvania” section of the website.

The public response to watching the natural drama of eagles raising their young was overwhelming. The camera provided a live look into the challenges and triumphs of nest life. The public’s fascination with bald eagles was demonstrated with 489,229 unique IP addresses viewing the nesting activities. The nest also was featured on the Game Commission Facebook page with many people liking the daily reports. In addition, many organizations and individuals posted observations and photographs of the nest in social media, amplifying the agency’s own successful educational outreach. The agency’s “Eagle Etiquette” approach has been adopted by many supporters of eagle monitoring, recreational watching, and conservation.

DISCUSSION

It can be difficult to tell if pairs move from bonding and nest building to incubation, especially if incubation is interrupted by bad weather or human activities. Established pairs have territory fidelity, but often have multiple nest sites within a territory. In some cases, an alternative nest is more difficult to see and escapes direct observations. Anecdotal reports suggest that estimates of both nest number and success rate are conservative. Increasing numbers of eagles nesting in the urban landscape where there are few secluded areas with appropriate habitat will increase eagle-human conflicts. As a result, bald eagle take permits have been granted and occasionally will be needed. The return of eagles to this landscape is a sign of habitat improvements including water quality, fish availability, and a healthy mature riparian forest. Their return has been embraced by the local public and media coverage has been intense.

It is unclear when nesting populations will approach saturation levels in Pennsylvania, as was predicted that saturation levels will be reached in the Chesapeake Bay population within the next decade (Watts et al. 2007). This leads to increased competition for quality nesting territories as the population grows. The presence of unmated adult bald eagles in the state during the breeding season indicate a growing floater population, suggesting the lack of suitable territories. These extra birds fill breeding vacancies as they become available, and are the individuals most likely to colonize new unoccupied habitat. This process leads to expansion out and away from areas with a high eagle concentration. More eagles will move into unoccupied habitat and begin to colonize lower quality watersheds. As the carrying capacity is reached, population growth rate will slow, indicating a maturing, healthy population. It is not clear if gaps in bald eagle nest distribution is due to water quality or other environmental issues or due to lack of coverage. There may be opportunities for bald eagles to colonize new stretches of quality streams in Pennsylvania especially in the Southwestern counties (Fig 1).

RECOMMENDATIONS

1. Identify and implement recovery actions from the Bald Eagle Management and recovery plan, 2010-2019.
2. Protect breeding, roosting, and foraging habitat. Use established bald eagle Best Management Practices, propagation area or restricted area designations where appropriate to protect established eagle nests with 330 meter (1,000 foot) buffer. Contribute eagle nest and winter roost data to Pennsylvania Natural Diversity Inventory, and U.S. Fish and Wildlife Service.
3. Develop and distribute materials to educate the public about eagle vulnerability to human activities and interference, emphasizing the importance of nesting habitat, and promoting eagle conservation through voluntary cooperation and understanding.
4. Use the charismatic, well-protected, and popular bald eagle as an umbrella species promoting the protection of riverine and palustrine habitat in Pennsylvania, and promoting the conservation of less known species that are high conservation priorities.

LITERATURE CITED

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- Leberman, R. C. 1992. Bald Eagle, *Haliaeetus leucocephalus*. Page 92-93 in D. W. Brauning, editor. Atlas of Breeding Birds in Pennsylvania. University of Pittsburgh Press, Pittsburgh, Pennsylvania, USA.
- U.S. Fish and Wildlife Service. 2009. Post-delisting Monitoring Plan for the Bald Eagle (*Haliaeetus leucocephalus*) in the Contiguous 48 States. U.S. Fish and Wildlife Service, Divisions of Endangered Species and Migratory Birds and State Programs, Midwest Regional Office, Twin Cities, Minnesota, USA.
- Watts, B. D., G. D. Therres, and M. A. Byrd. 2007. Status, Distribution, and the Future of Bald Eagles in the Chesapeake Bay Area. Waterbirds 30 (Special Publication): 25-38.

Table 1. Bald eagle nests and fledglings produced in Pennsylvania, based on 2016 productivity sample. Observed figures are for nests where the outcome was determined. The high estimate assumes all the nests with unknown fates succeeded and the low assumes all nests with unknown fates failed.

Nest fate	Observed	High	Low
Fledged	78	162	78
Failed	11	11	95
Nest gone/no activity	12	12	12
Insufficient information	84	0	0
	185	185	185
Success rate	0.88	0.45	0.94
Fledglings	140	224	91
Productivity/nest	1.57	1.29	0.81

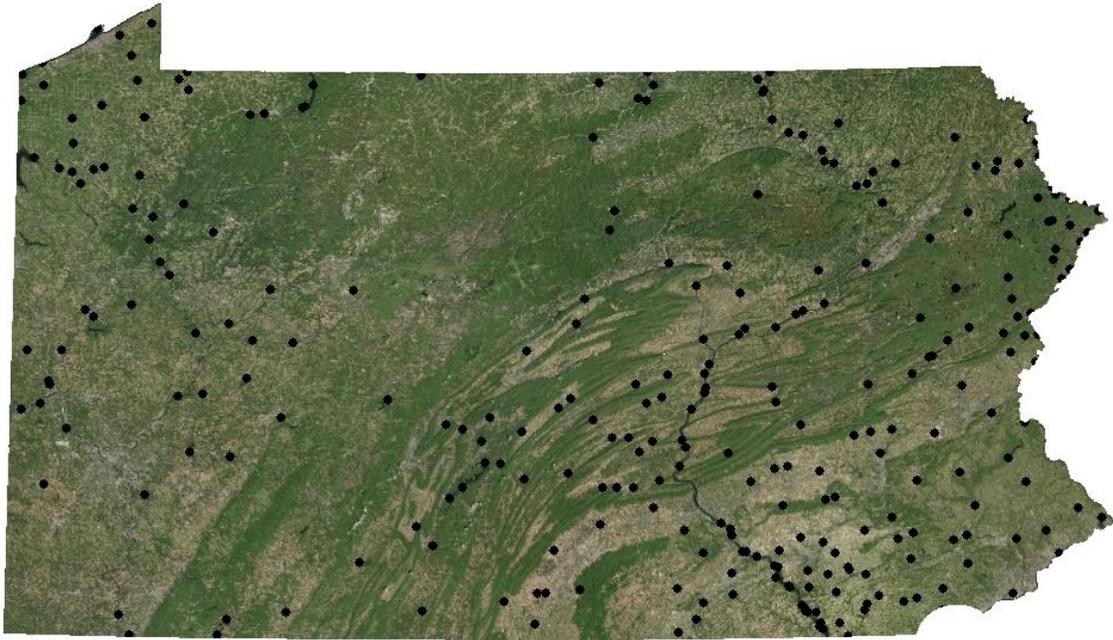


Figure 1. Distribution of reported bald eagle nesting territories in Pennsylvania in 2016.