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New Jersey Bald Eagle Management Project

2003

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NEW JERSEY DIVISION OF
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Abstract:

The Division of Fish and Wildlife's Endangered and Nongame Species Program (ENSP) biologists and volunteer observers located and monitored bald eagle nests and territories. A new record high of 40 eagle pairs was monitored during the nesting season; 35 of those were active (with eggs) and five more were territorial (in a nest area). Southern New Jersey continues to support the most nests (75%), while 7 were in central and 3 were in northern NJ. Twenty-five nests were successful in producing 41 young, for a productivity rate of 1.17 young per active nest. ENSP staff banded and took blood samples from 18 eaglets at eleven nests. Ten nests failed to produce viable hatchlings, mainly due to contaminants and human disturbance. ENSP staff, regional coordinators, and volunteers reported a total of 149 bald eagles counted in the January 2003 annual Midwinter Bald Eagle Survey. Forty-one eagles were recorded in north NJ and 108 in the south.

Introduction

Historically New Jersey hosted more than 20 pairs of nesting bald eagles, mostly in the southern half of the state. As a result of the use of the pesticide dichlorodiphenyltrichloroethane, commonly known as DDT, the number of nesting pairs of bald eagles in the state declined to only one by 1970 and remained at one into the early 1980's. Use of DDT was banned in the United States in 1972. That ban, combined with restoration efforts by biologists within the Division of Fish and Wildlife's Endangered and Nongame Species Program (ENSP), resulted in a population increase to 23 active pairs by 2000. ENSP recovery efforts – implemented since the early 1980's – have resulted in an exceptional recovery as New Jersey's eagle population has rebounded from the edge of extirpation.

In 1982, after the Bear Swamp nest – New Jersey's only active bald eagle nest since 1970 – had failed at least six consecutive years, ENSP biologists removed the egg for artificial incubation, and fostered the young nestling back to the nest. As a result of residual DDT contamination, the Bear Swamp eggs were too thin to withstand normal incubation. Artificial incubation and fostering chicks continued successfully until 1989, when the female of the pair was replaced and the pair was able to hatch their own eggs.

Increasing the production from a single nest, however, was not enough to boost the state's population in a reasonable amount of time. Mortality rates are high in young eagles (as high as 80%), and they do not reproduce until about five years of age. ENSP instituted a hacking project

in 1983 that resulted in the release of 60 young eagles in NJ over an eight-year period (Niles et al. 1991). These eagles have contributed to the increase in nesting pairs since 1990.

Bald eagles nesting in NJ face many threats. Disturbance is the greatest of these, as people are naturally attracted to the sight of them (Niles et al. 1991). Habitat destruction is also a common problem. Further, in the long term, there is evidence that accumulation of contaminants may threaten the eagle population in NJ, especially in the Delaware Bay region.

ENSP biologists continually work to manage and reduce disturbance in eagle habitats, especially around nest sites. A corps of experienced volunteers, as well as public education and established viewing areas, are crucial to this effort. Biologists also work to protect habitat in a variety of ways, including working with landowners, land acquisition and management, and applying the state's land use regulations. ENSP is also continuing to investigate the impacts of organochlorines and heavy metals in eagles and other raptors nesting in the Delaware Bay region. Bald eagles, ospreys, and peregrine falcons nesting in the region exhibit some reproductive impairment relative to other areas (Steidl et al. 1991, Clark et al. 1998, 2001). ENSP monitors these species during the nesting season to evaluate nest success and assess any problems that occur.

The ENSP, with the Division's Bureau of Law Enforcement and volunteer assistance, works intensively to protect bald eagle nest sites. However, with increasing competition for space in the most densely populated state in the nation, it is becoming clear that critical habitat needs to be identified and, where possible, protected. Critical habitat for eagles includes areas used for foraging, roosting and nesting.

The population of wintering bald eagles has grown along with the nesting population, especially in the last ten years. This growth reflects increasing nesting populations in NJ and the northeast, as each state's recovery effort pays off. In recognition of this success, the federal government upgraded the status of the bald eagle from endangered to threatened in July of 1995, and in 2000 proposed federal de-listing of the species. The federal status remains threatened; however, the eagle remains endangered in New Jersey, and regulatory protection remains the same.

Methods

Nest Survey

All known nest sites are monitored from January through July. Volunteer observers watch nests from a minimum distance of 400 m. using binoculars and spotting scopes, for periods of two or more hours each week. They record all data including number of birds observed, courtship or nesting behaviors, incubation and exchanges, feeding, and other parental care behaviors that provide valuable information on the nesting status. ENSP staff contact volunteers weekly to discuss their observations. Dates are recorded for incubation, hatching, banding, fledging, and, if applicable, nest failure. Hatching dates are used to schedule eaglet banding, and observers' notes determine if closer nest investigation by ENSP biologists is warranted.

Observers statewide report bald eagle observations to ENSP biologists, who analyze the information for potential nest locations. ENSP staff and volunteers investigate territorial bald eagles for possible nest sites through field observations. When enough evidence has been collected to suggest a probable location, ENSP biologists often conduct aerial surveys of the region to locate a nest.

All nests are secured from disturbance with barriers and/or posted signs. ENSP staff works in partnership with landowners and land managers to cooperatively protect each nest. Volunteers notify ENSP staff immediately if any unusual or threatening activities are seen around the nest site. The Division's Bureau of Law Enforcement acts to enforce protection measures as needed.

When nestlings are between five and eight weeks old, biologists enter the nest site to band the young. A biologist climbs the tree and places nestlings into a large duffel bag and lowers them, one at a time, to the ground. A team records measurements (bill depth and length, eighth primary length, tarsal width, and weight) and bands each eaglet with a federal band and a green state color band. A veterinarian examines each bird and takes a blood sample for contaminant analysis. Blood is collected and stored following techniques in Bowerman et al. (1994). Samples are stored frozen pending analysis by a technical lab. Nest trees are generally not climbed the first season to avoid associating disturbance with the new site.

Wintering Eagle Survey

The nationwide Midwinter Bald Eagle Survey is conducted every January to monitor population levels. The ENSP contracted Vince Elia of New Jersey Audubon Society's Cape May Bird Observatory and Allan Ambler of the Delaware Water Gap National Recreation Area to coordinate the survey in southern and northern NJ respectively. These researchers organized volunteers to cover all suitable and known wintering habitat, then tracked the number of individual eagles observed on both days of the survey using plumage characteristics and time observed. Their results, as well as those from additional volunteers at northern reservoirs, were compiled by ENSP biologists to determine statewide totals. Final results were tabulated by ENSP staff according to standardized survey routes, and provided to the Raptor Research and Technical Assistance Center in the federal Bureau of Land Management. For the second year volunteers also mapped eagle activity during the two day survey; these data delineating critical eagle wintering habitat will be incorporated into the NJ Landscape Project.

Results

Nest Survey

The statewide population increased to 40 pairs in 2003, up from 34 last year, and up from six pairs ten years ago, an increase of almost 600% (Figure 1). Thirty-five pairs were active (meaning they laid eggs). Twenty-five nests were successful in producing 41 young, for a productivity rate of 1.17 young per active nest, slightly greater than that required for population maintenance (0.9-1.1 young/active nest) (Figure 2). Most nests were located in the southern part of the state, particularly within 20 km of Delaware River and Bay (Map 1). All nests and potential sites are described individually below and in Table 1.

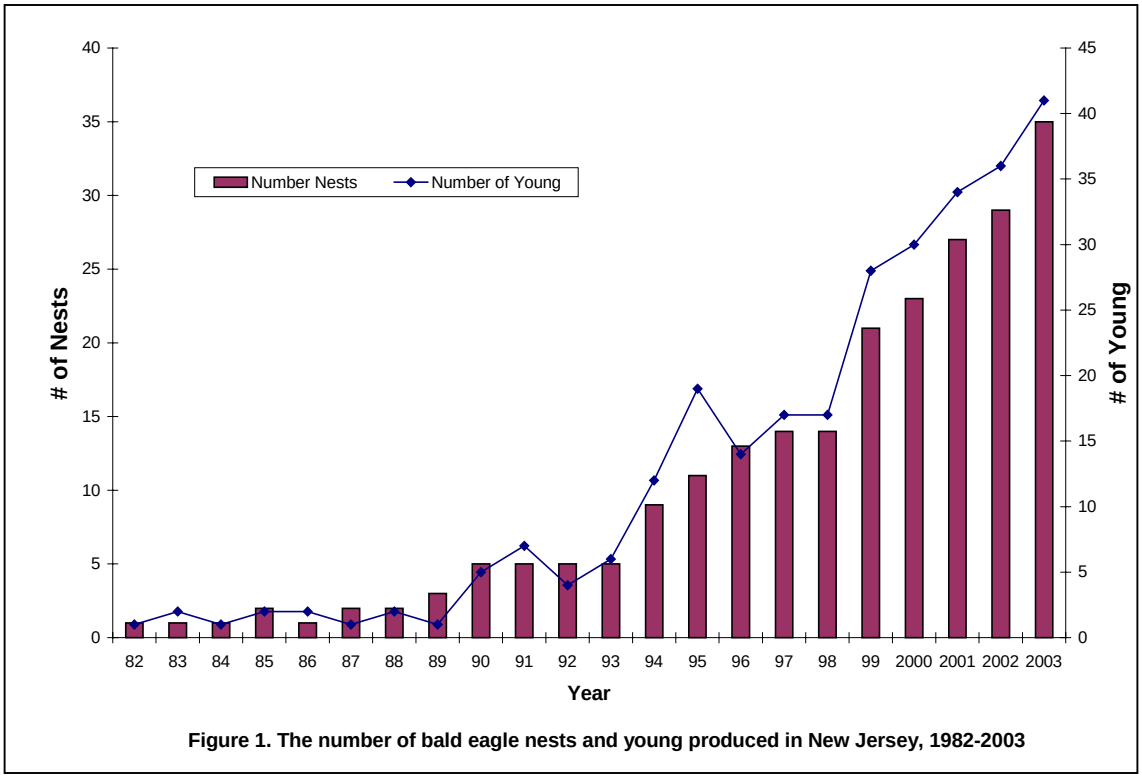


Figure 1. The number of bald eagle nests and young produced in New Jersey, 1982-2003

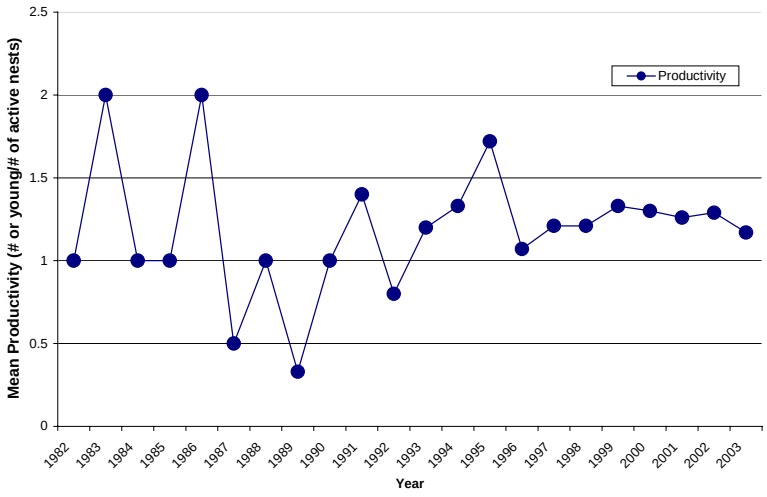
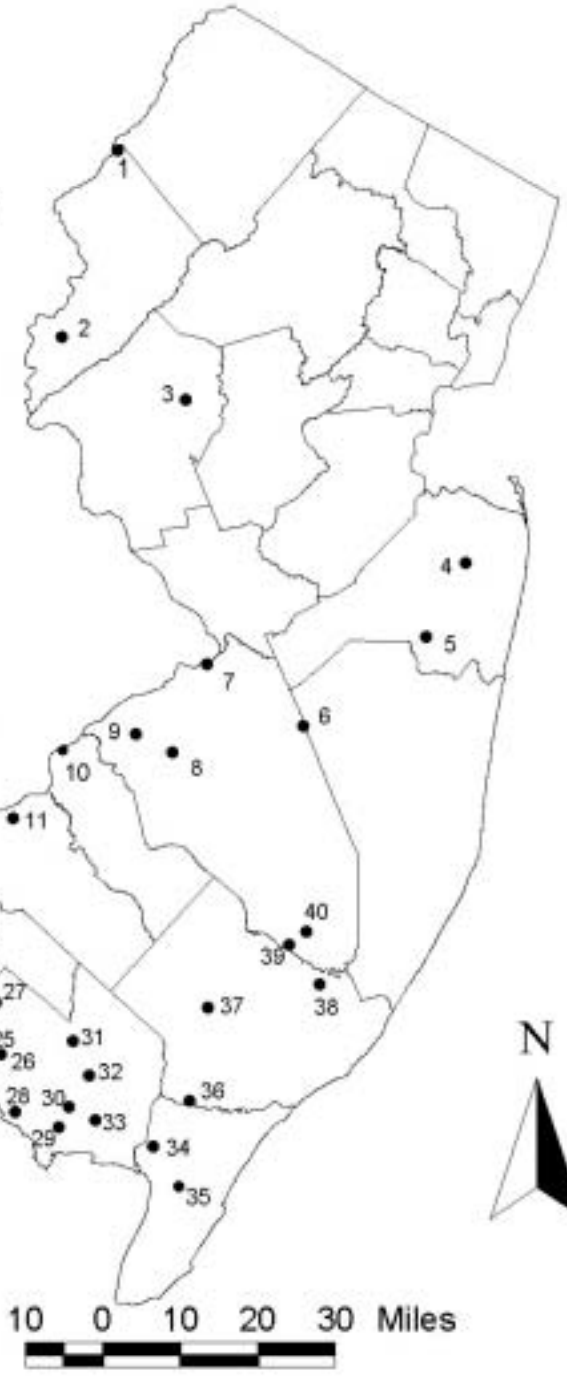


Figure 2. Productivity Of Eagle Nests in New Jersey, 1982-2003

Map 1. Bald Eagle Nest Sites, 2003

1 Delaware Water Gap
2 Merrill Creek Reservoir
3 Round Valley Reservoir
4 Navesink River
5 Manasquan River
6 Fort Dix Military Reservation
7 Burlington County/Delaware River
8 Rancocas Creek 2
9 Rancocas Creek 1
10 Camden County
11 Mantua Creek
12 Raccoon Creek
13 Mannington Meadows 1
14 Mannington Meadows 2
15 Supawna
16 Alloways Creek 2
17 Alloways Creek 3
18 Alloways Creek 1
19 Stow Creek 1
20 Stow Creek 2
21 Cohansey River- Greenwich
22 Cohansey River- Fairfield
23 Cohansey River- Dix
24 Cohansey River-Shepards Mill
25 Cohansey River-Hopewell West
26 Cohansey River-Hopewell East
27 Seely Lake
28 Nantuxent Creek
29 Dividing Creek
30 Bear Swamp
31 Union Lake
32 Maurice River 3
33 Maurice River 1
34 Belleplain
35 South Dennis
36 Tuckahoe
37 Lake Lenape
38 Galloway
39 Mullica River
40 Wading River



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Alloways Creek 1 (Hancocks Bridge)
This is the seventh season that this pair nested in a willow oak (*Quercus phellos*) adjacent to an active farm field. Incubation began on March 13 and eggs hatched on April 17. On June 28 when the two nestlings were eleven weeks of age, the nest collapsed and fell out of the tree, shortly after a helicopter was observed hovering close by. The nest observer and biologists went out to the nest and found both birds alive and well. One bird was able to fly and the other was very close to fledging. Both birds fledged successfully despite the disturbance.

Alloways Creek 2 (Alloway)
The Alloways Creek 2 pair built a new nest this season in fairly close proximity to the old nest, along the upper Alloways Creek drainage in a large contiguous forest on state land. The pair began incubating around March 10 and should have hatched around April 14. Nest failure was reported on March 31. The reason for failure is believed to be disturbance.

Alloways Creek 3 (Quinton)
This new pair began incubating on February 23 along the edge of a farm field near the Alloways Creek. On March 10 during a windstorm, the nest blew out of the tree and the eggs were destroyed. The pair was seen in the area but did not re-nest in the same tree. On July 31 a dead immature eagle was found under a previously unknown eagle nest close by and reported to the ENSP. This nest is in close proximity to the original nest and is thought to be the same pair. It is unknown whether the pair successfully fledged any young this season.

Bear Swamp
The pair nested in a partially dead tree that they had used in 2000. On March 18 an ENSP biologist flew over the nest and observed incubation. The exact date of hatching and fledging is unknown due to the difficulty in observing this nest.

Belleplain (East Creek Pond)
The Belleplain State Forest eagles for the fifth year nested in a pitch pine *(Pinus rigida)* lying in a large contiguous forest. This nest is not viewable from the ground. On March 18 a biologist flew over the nest and observed incubation. On May 6 a biologist flew over the nest and observed two chicks approximately four weeks of age.

Burlington County/ Delaware River
The eagle pair did not return to their nest atop a huge tulip poplar (*Liriodendron tulipifera)* in Burlington County near the Delaware River, but were found March 11 incubating in a new nest tree about 500 m away. Hatching occurred around April 16 and two birds fledged in late May.

Camden County Nest
This new nest was found on March 20 in Camden County along the Delaware River. This is the first pair of eagles to nest in Camden County in known history. The pair began incubation around March 26. Hatching was suspected when feeding occurred at the nest on May 9. The eagles were last observed at the nest on May 12. Nest failure was confirmed on May 19. Though the reason for failure is unknown, contaminants cannot be ruled out. Biologists will continue to monitor this pair next season.

Cohansey River (Fairfield)
This pair was seen at last season's nest and in the area of the nest, but did not incubate. Biologists and observers will closely monitor this pair next nesting season.

Cohansey River (Greenwich)
For the fourth season the Greenwich pair occupied their nest in a tulip poplar. The pair began incubation on February 6, and hatching occurred on March 13. Biologists banded one eaglet on April 25 and the bird fledged June 3.

Cohansey River (Shepards Mill)
This newest nest along the Cohansey River was discovered early in the season adjacent to farm fields. The birds began incubating February 12 and hatching occurred on March 20. One bird fledged from this nest on June 15.

Cohansey River (Hopewell West)
This nest is located in a large American beech (*Fagus grandifolia*) next to an active agricultural area. This is the fifth season that this pair nested in this tree, and fledged two young for the second year in a row. The pair was incubating as of March 10 and hatching occurred around April 16. Biologists banded the eaglets on May 29 and the birds fledged July 5. In September during Hurricane Isabel, the nest tree broke in half and the nest was destroyed. This pair will be monitored closely next season to determine where they take up nesting.

Cohansey River (Hopewell East)
This was the second year that this pair nested along the Cohansey near an active agricultural field. Incubation was reported as of January 30, so hatching was expected around March 6. The nest failed as of March 17. The reason for failure is unknown, but the timing suggests problems in incubation, infertile eggs or contaminants.

Cohansey River (Dix)
This new nest was found late in the season in a Wildlife Management Area. One young bird fledged from the nest. It is uncertain whether this is a new pair or an established pair. Nest observers will closely monitor this pair in the 2004 nesting season.

Delaware Water Gap (Walpack)
This was an exciting find this year: a new nest on the New Jersey's upper Delaware River. The pair was found incubating March 21, and fledged 1 young July 17.

Dividing Creek
For the second year this pair nested in a pine tree located in the tidal marsh near Delaware Bay. The pair began incubating in mid-February and hatching occurred around March 10. Biologists banded the two birds on April 25 and fledging occurred around June 17.

Fort Dix
For the fourth year eagles nested in a pitch pine in a large contiguous forest on the Fort Dix Military Reservation. Incubation began in mid-February. Nest failure was reported on April 10. One possible reason for failure could be disturbance due to increased military activity at the site during incubation.

Galloway Township
For the fifth year the Galloway pair nested atop a pitch pine on a tidal creek tree island. The eagles began incubating around March 8 and hatching was reported April 1. Biologists banded the two eaglets on May 18 and fledging was observed June 25.

Lake Lenape
For the fifth year the Lake Lenape pair nested in the ENSP-built nest, atop a super-canopy pitch pine in a large contiguous pine forest. Incubation was first observed February 11 with hatching occurring around April 1. Biologists banded one eaglet on May 2 and fledging was first observed on June 12.

Manasquan Reservoir
For the second year this pair nested successfully at a reservoir managed by Monmouth County Park Commission. This nest is located in close proximity to the new Environmental Education Center. The area around the nest was posted as well as the reservoir near the nest to prevent undue disturbance during nesting. The pair began incubation on March 8 and hatching occurred on April 12. Two birds fledged on June 26.

Mannington Meadows (Horne Run)
For the fifth year this pair nested atop a large black oak (*Quercus velutina*) lying between a farm field and tidal water spit. The pair began incubation around the end of February. Nest failure was reported on March 22, prior to expected hatching. The reason for this failure is unknown, but this pair has a history of high contaminant levels. It will be important to watch them closely in 2004.

Mannington Meadows 2 (Halls Run)
For the third year this pair nested successfully in a large tulip poplar along the edge of an active agricultural field. The pair was incubating by March 1 and hatching was reported on April 9. Biologists banded two birds on May 21 and fledging was first observed on July 15.

Mantua Creek
The Mantua Creek pair relocated their nest from an area highly visible from the road to a more removed site along the creek. The pair began incubating on March 28 and hatching occurred on May 3. Biologists banded the two nestlings on July 2 and placed a transmitter on the female nestling. Fledging occurred on August 8. The female (frequency 150.262) was tracked locally from fledging until September 8, when she left the area and was not relocated again during the fall. In late November nest observers found that the nest tree had been blown down in a windstorm. It is hoped that the pair will re-nest in the same area next season, volunteers will continue to monitor this pair closely.

Maurice River 1-South (Commercial)
For the fifth year the eagle pair nested atop a partially dead (and unclimbable) red maple (*Acer rubrum*). The tree lies on a forested peninsula jutting out into the rich Maurice River estuary, and the nest is quite difficult to observe. Incubation was underway on or before February 25 and hatching occurred in mid-April. One bird fledged as of July 1.

Maurice River North (Millville)
For the third year this pair nested in a pitch pine along the edge of the Maurice River. Incubation was not observed until March 1 and hatching occurred around April 7. Biologists banded the one eaglet on May 12 and fledging occurred in June.

Merrill Creek Reservoir
This was the fifth year of nesting and the second year the pair used a new nest on the shore of the reservoir. Reservoir personnel worked closely with ENSP staff to protect the nest site. Incubation was reported on February 19, and hatching was reported on March 31. The nest failed, however, on April 21; the reason for failure may have been related to a late season snowstorm on April 7.

Mullica River
For the third year this pair nested in a pitch pine on the Mullica River. Incubation began around February 24 and nest failure was reported on March 29. The reason for failure is believed to be human disturbance.

Nantuxent Creek
The pair moved to a new tree this season, making it their third location in nine years in the marsh along Nantuxent Creek. Incubation began on February 23 and hatching was reported on March 27. Two birds fledged in June.

Navesink River
For the second season this pair nested in a large white oak, making four years in the same area. Incubation was reported on February 24 and hatching was reported on April 8. Biologists banded the two eaglets on May 29 and fledging was reported on June 31.

Raccoon Creek (Delaware River)
The pair occupied the Delaware River site they have used since 1997. The pair began incubation March 1. Nest failure was reported on April 20. High levels of contaminants are suspected to be the cause, as this pair has a history of egg failure due to organochlorines, however a new female in the pair this year was hope for renewed success.

Rancocas Creek 1
For the second year this pair used a nest in a sweetgum tree located on the edge of an active farm field. Incubation began on February 6. Nest failure was reported on March 20, one week after the expected hatch date. Reason for failure is suspected to be contaminants.

Rancocas Creek 2 (East)
This pair, first territorial in 2001, was not seen during the nesting season. Nest volunteers and staff will continue to monitor this pair closely during the 2004 nesting season.

Round Valley Reservoir
The eagles again the site occupied since 1995 near Round Valley Reservoir. Incubation was reported on February 27 and hatching occurred on April 2. Two birds fledged around July 3.

Seely Lake
This pair, first territorial in 2001, was not seen during the nesting season. Observers and ENSP staff will watch for this pair during the 2003 nesting season.

South Dennis
This territorial pair established a nest early in the season but did not incubate. Biologists flew over the nest and confirmed that the pair was no longer present. The pair has been sighted in the vicinity of the nest and surrounding area. Biologists will closely monitor this pair in the 2004 nesting season

Stow Creek North
This pair left the nest in a large sycamore and built a new nest further south along Stow Creek, making it their third nest move since 1990. The nest could still be seen from the public viewing platform on Canton Road. Incubation began on February 27 and hatching occurred on April 5. The nest blew out of the tree in June during a windstorm, at the time the three eaglets were close to fledging. The nest observer closely monitored the birds and by July 3 all three had fledged. Between 1990 and 2003, the Stow Creek eagle pair successfully raised 30 eaglets, making them the most productive pair in the state.

Stow Creek South
This was the second season that this pair nested along Stow Creek. The pair worked on one nest in the marsh early in the season, but then moved to a second nest in a pine tree in a more residential area. The pair began incubation on March 29 and hatching occurred on May 5. Two eaglets fledged on July 31.

Supawna Meadows
The Supawna eagles for a fifth year occupied a nest built on a PSE&G transmission tower in Supawna Meadows National Wildlife Refuge. The pair began incubating on March 1 and hatching occurred around April 12. Biologists banded the single eaglet on May 15 and fledging was first observed on July 7.

Tuckahoe
This pair, active for its second year, was found incubating in a new nest along the Tuckahoe River. Hatching was reported on April 10. One bird fledged on July 3.

Union Lake
This was the tenth season that eagles occupied the nest atop a pitch pine on Union Lake Wildlife Management Area. Incubation was not observed until March 12 and hatching occurred around

March 23. Biologists banded the two eaglets on May 2 and fledging was first reported on June 17. ENSP staff continued to mark a small lake cove near the nest as a "Restricted Area" to minimize any disturbance to the pair.

Wading River
The Wading River pair was sighted on several occasions this season. It is unknown where the birds nested, as they did not return to their 2002 nest. Volunteers and staff will continue to monitor this area next season.

Potential Nest Sites
ENSP biologists and observers actively searched for possible nesting bald eagles in several different locations. The searches were in response to the many reports of eagles engaging in breeding behaviors. Areas that remain promising are Big Timber Creek, Batsto Lake, Oswego Lake and Great Egg Harbor River, which all have year-round eagle activity. In addition, several inland reservoirs in the north, including Wanaque, hold promise of eventual eagle nesting.

Table 1. Production and Significant Dates of Bald Eagles Nesting in NJ, 2003

Nest Site	Incubation	Hatching	Banding	Fledging	No. Fledged	Notes
Alloways Creek 1	3/13/03	4/17/03	N/A	6/29/03	2	Nest fell out of tree 6/28/03
Alloways Creek 2	3/10/03	N/A	N/A	N/A	0	Nest failed 3/31/03
Alloways Creek 3	2/23/03	N/A	N/A	N/A	0	Nest blew out of tree 3/10/03
Bear Swamp	3/18/03F	N/A	N/A	Unknown	1	
Belleplain	3/18/03F	Unknown	N/A	Unknown	2	Flew over nest 5/6/03, two four week old eaglets
Burlington Co./Del. R.	3/11/03F	4/16/03	N/A	Unknown	2	New nest
Camden County	3/26/03	5/9/03	N/A	N/A	0	New nest; failed mid May
Cohansey (Fairfield)	N/A	N/A	N/A	N/A	0	Pair in sighted in area of nest, but did not incubate
Cohansey (Greenwich)	2/6/03	3/13/03	4/25/03	6/3/03	1	
Cohansey (Shepards Mill)	2/12/03	3/20/03	N/A	6/15/03	1	New nest
Cohansey (Hopewell West)	3/10/03	4/16/03	5/29/03	7/5/03	2	
Cohansey (Hopewell East)	1/30/03	N/A	N/A	N/A	0	Nest failed 3/17/03
Cohansey Dix	N/A	N/A	N/A	N/A	1	New nest, found late in the season with one eaglet.
Delaware Water Gap	3/21/03*	unknown	N/A	7/17/03	1	New nest
Dividing Creek	2/14-2/23/03	3/10/03*	4/25/03	6/17/03	2	
Fort Dix	2/13-2/25/03	N/A	N/A	N/A	0	Nest failed 4/10/03
Galloway	3/8/03	4/1/03	5/18/03	6/25/03	2	
Lake Lenape	2/11/03	3/25/03	5/2/03	6/12/03	1	
Manasquan Reservoir	3/8/03	4/12/03	N/A	6/26/03	2	
Mannington Meadows 1	2/28-3/8/03	4/5-4/12/03	N/A	N/A	0	Nest failed 3/22/03
Mannington Meadows 2	3/1/03	4/9/03	5/21/03	7/15/03	2	
Mantua Creek	3/28/03	5/3/03	7/2/03	8/8/03	2	Transmitter placed on female

Table 1. Continued

Nest Site	Incubation	Hatching	Banding	Fledging	No. Fledged	Notes
Maurice River South	2/25/03	4/15-4/27/03	N/A	7/1/03	1	
Maurice River North	<3/10/03	*4/ 7/03	5/12/03	6/03	1	
Merrill Creek	2/19/03	3/31/03*	N/A	N/A	0	Failed 4/21/03, failure occurred after snow storm 4/8/03.
Mullica River	2/24/03	N/A	N/A	N/A	0	Failed 3/29/03
Nantuxent Creek	2/23/03	3/27/03	N/A	6/03	2	
Navesink River	2/24/03	4/8/03	5/29/03	6/31/03	2	
Raccoon Creek	3/1/03	N/A	N/A	N/A	0	Failed 4/20/03
Rancocas Creek 1	2/6/03	N/A	N/A	N/A	0	Failed 3/20/03
Rancocas Creek 2	N/A	N/A	N/A	N/A	0	No sightings
Round Valley	2/27/03	4/2/03	N/A	7/3/03	2	
Seely Lake	N/A	N/A	N/A	N/A	0	
South Dennis	N/A	N/A	N/A	N/A	0	Territorial pair
Stow Creek North	2/27/03	4/5/03	N/A	7/5/03	3	Nest blew out of tree 6/03
Stow Creek South	3/29/03	5/5/03	N/A	7/31/03	2	New nest
Supawna Meadows	3/1/03	4/12/03	5/15/03	7/7/03	1	
Tuckahoe	Unknown	4/10/03	N/A	7/3/03	1	New nest
Union Lake	<3/12/03	<3/23/03	5/2/03	6/17/03	2	
Wading River	N/A	N/A	N/A	N/A	0	Nest not found

* These dates are estimates based on events with known dates.
F This is the date of flyover, actual incubation dates are unknown.

Wintering Eagle Survey

A total of 149 bald eagles were observed during the Midwinter Survey on January 11-12, 2003 (Table 2). This count is 15% below 1997's record of 176 (Figure 3). Southern New Jersey continued to host the majority of the state's wintering birds.

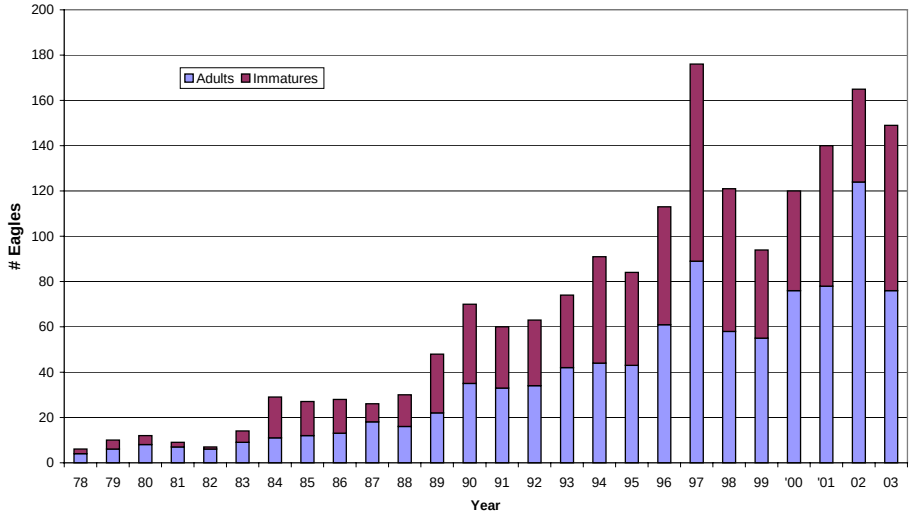

Figure 3. Midwinter Bald Eagle Counts 1978 - 2003

One hundred eight bald eagles were counted in southern New Jersey, of which 55 were adults (Table 2; Elia 2003). Most southern eagles were observed in the Delaware Bay region (52%), followed by Atlantic Coast watersheds (33%) and the lower Delaware River (15%). The two transects with the highest numbers of sightings were Maurice River with 26 eagles and Mullica and Wading Rivers with 18 eagles counted.

As is usually the case, northern New Jersey with 41 bald eagles had fewer than the south (Ambler 2003). The main sites for northern New Jersey's wintering eagles were the Delaware Water Gap (41%) and northern reservoirs (44%).

Most winter survey volunteers recorded details on individual eagles sighted, as well as point locations on maps. These point locations were digitized and will be used to design critical wintering habitat areas.

Table 2. Bald Eagles counted in the NJ Midwinter Bald Eagle Survey, January 11-12, 2003

Region	Survey Transect	Subregion	BE Total	Adult	Immature	Unkn. BE	Golden
South	Brigantine NWR	AC	1	0	1	0	0
	Cohansey River	DB	17	9	8	0	0
	Delaware River - Riverton to Trenton	SD	0	0	0	0	0
	Fortescue to Stow Creek	DB	2	0	2	0	0
	Fort Dix	AC	1	1	0	0	0
	Great Egg Harbor & Tuckahoe Rivers	AC	8	2	6	0	0
	Manahawkin to Lower Bass River	AC	3	2	1	0	0
	Manasquan Reservoir	AC	2	2	0	0	0
	Maurice River, Turkey Point, Bear Swamp	DB	26	12	14	0	1
	Mullica & Wading Rivers	AC	18	8	10	0	2
	Oldman's Creek	SD	0	0	0	0	0
	Raccoon Creek	SD	2	2	0	0	0
	Rancocas Creek	SD	2	2	0	0	0
	Salem County	SD	12	8	4	0	0
	Stow Creek	DB	3	2	1	0	0
	Swimming River Reservoir	AC	0	0	0	0	0
	Thompson's to Reeds Beach	DB	8	4	4	0	1
	Whitesbog	AC	3	1	2	0	1
South	**Subtotal**		**108**	**55**	**53**	**0**	**5**
North	Delaware River - Columbia to Trenton	ND	0	0	0	0	0
	Delaware Water Gap	DWG	17	11	6	0	3
	Hudson River - Pallisades	P	6	3	3	0	0
	Jersey City Reservoirs (Boonton & Split Rock)	IR	4	2	2	0	0
	Merril Creek Reservoir	IR	2	2	0	0	0
	Newark Watershed (Clinton & Charlottesburg)	IR	2	1	1	0	0
	Oradell Reservoir	IR	2	0	2	0	0
	Round Valley Reservoir	IR	0	0	0	0	0
	Wanaque & Monksville Reservoir	IR	8	2	6	0	1
North	**Subtotal**		**41**	**21**	**20**	**0**	**4**
State	**Total**		**149**	**76**	**73**	**0**	**9**

Subregion:AC=Atlantic Coast, DB=Delaware Bay, DWG=Delaware Water Gap, IR=Inland Reservoirs, ND=Northern Delaware River, P=Palisades-Hudson River, SD=Southern Delaware River

Contaminants Research

During nest visits, biologists collected blood samples from 18 nestlings at 11 nests. These samples were added to 81 archived samples that are available for contaminant analysis. One unhatched, addled egg was collected from the Cohansey-Greenwich nest, found during banding of the one nestling. Staff did not climb any failed nests and thus did not collect any other failed eggs. ENSP staff is pursuing additional contaminants research using archived samples.

Recoveries

On October 30, 2002 an eagle was found dead in Elsinboro, Salem County. The necropsy by pathologist Dr. Doug Roscoe concluded that it had died when struck by a vehicle.

On March 17, 2003 a juvenile bald eagle was found dead on Route 55 in Cumberland County, southern New Jersey. The bird had been hit by a vehicle.

On May 15, 2003 an injured adult bald eagle in Whitesboro, Cape May County, was reported to rehabilitator Stephen Serwatka. The bird was recovered and found to have a leghold trap attached to its leg. The bird had been banded as a nestling at Middle Marsh in 1999. The bird was transferred to Don Bonica at Toms River Avian Care where it was treated. The bird lost its left foot but was otherwise in good health, and was released at the Tuckahoe Wildlife Management Area on June 18, 2003.

An eagle carcass was found by a landowner under a previously unknown eagle nest near Alloways Creek. The carcass was delivered to Dr. Doug Roscoe for necropsy. The nest was in fairly close proximity to the failed Alloways 3 nest and is most likely this pair's second attempt this season.

A three year-old eagle was found dead behind a mall in Pennsville on September 29, 2003. USFWS Law Enforcement officer D. Manera sent the bird to the USFWS lab for necropsy. It was determined that the bird had been electrocuted. The bird had been banded by ENSP biologists at Alloways Creek 1 on May 20, 2000.

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