New Jersey Division of Fish, Game and Wildlife

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New Jersey Bald Eagle Management Project, 1998

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Abstract:

Endangered and Nongame Species Program (ENSP) biologists and volunteer observers located and monitored bald eagle nests and territories, and cooperators coordinated the annual midwinter bald eagle survey. A total of seventeen eagle pairs, sixteen in southern and one in northern New Jersey, were monitored during the nesting season. Fourteen of those pairs had active nests. Nine pairs were successful in hatching, rearing and fledging 16 young. The Raccoon Creek pair received a foster chick hatched in captivity. That eaglet brought the number of fledglings to 17 for 1998. ENSP staff banded and took blood samples from 11 eaglets at six nests. ENSP staff and biologists used radio telemetry to monitor the local movements of the Raccoon Creek fledgling. Four nests, Galloway, Horne Run (Mannington), Lake Lenape and Rancocas Creek, failed. Contaminants may have caused the failures at Horne Run and Rancocas Creek, and disturbance seems the likely factor at Galloway and Lenape. An attempt to foster a fertile egg into the Horne Run nest was unsuccessful. The contents of the eggs from the Horne Run pair and of the egg from the Raccoon Creek pair were prepared for contaminant analysis. Cooperators, ENSP staff, and volunteers reported a total of 121 bald eagles counted in January's midwinter survey, 28 in the north and 93 in the south.

Introduction

New Jersey was once home to more than 20 pairs of nesting bald eagles. As a result of the use of the pesticide dichlorodiphenyltrichloroethane, more 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 Endangered and Nongame Species Program (ENSP) acted to increase in the number of New Jersey bald eagles to 14 active pairs in 1998. This number is the same as 1997, although the configuration has changed a little. ENSP recovery efforts - implemented in the early 1980's - are now bearing fruit, as New Jersey's eagle population rebounds from the edge of extirpation.

In 1982, after Bear Swamp - 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 back to the nest. The necessity of this fostering technique was due to eggshell thinning as a result of DDT contamination. The eggs, if left in the nest for the adult eagles to incubate, would crack under the birds' weight. Fostering 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 four or 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 (Figure 1).

Bald eagles nesting in NJ face many threats. Disturbance is the greatest threat to eagles, 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. Education and established viewing areas are important in this effort, as are the efforts of eagle project volunteers. Biologists also work to protect habitat in a variety of ways, including working with landowners, land acquisition experts, and through the state's land use regulations. ENSP is continuing to investigate the possible 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, 1991 and ENSP unpub. data). ENSP monitors these species during the nesting season to evaluate nest success and assess any problems that occur.

The NJ ENSP, with the Division's Bureau of Law Enforcement and volunteer assistance does a good job protecting bald eagle nest sites. However, with increasing competition for space in the most densely populated state in the nation, it is becoming clear that all of the eagles' critical habitat needs to be identified and, where possible, protected. Critical habitat for eagles is that which is used for foraging, roosting, perching and nesting.

The population of wintering bald eagles has grown along with the nesting population, especially in the last ten years (Fig. 2). 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 began discussions on delisting the bald eagle altogether. The federal status change reflects the increasing eagle population nationwide, but the eagle is still a state-listed endangered species, and regulatory protection remains the same.

Methods

Nest Survey

All known nest sites are monitored January through July. Volunteer observers watch nests from a minimum distance of 400 yards using binoculars and spotting scopes, for periods of one to three hours (or more) each week. They record all data including number of birds observed, courtship or nesting behaviors, incubation and exchanges, feeding, and other parental care behaviors which 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. This information is used to schedule eaglet banding, and to determine if closer nest investigation by ENSP biologists is warranted.

Numerous observers report statewide bald eagle observations to ENSP biologists, who analyze the data for potential nest

locations. ENSP staff and volunteers investigate territorial bald eagle pairs for possible nest sites through field observations. When enough evidence has been collected to substantiate a probable location, ENSP biologists 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 and 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 not climbed the first season to avoid associating undue disturbance with the new site.

The adjacentshores of Raccoon Creek are being developed rapidly and the eagles that nest there have moved considerably along the creek. It is therefore important to delineate the critical habitat for those birds. This year, to assist in the definition of such areas, ENSP staff placed a radio transmitter on the eaglet that was fostered into that nest. Telemetry equipment enabled ENSP biologists and volunteer staff to monitor the eaglet after fledging, an otherwise very difficult task to achieve.

Wintering Eagle Survey

The nationwide Midwinter Bald Eagle Survey is conducted every January to monitor population levels. The ENSP contracted Pat Sutton of New Jersey Audubon Society's Cape May Bird Observatory and Allan Ambler of the Delaware Water Gap NRA 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 in the north were compiled by ENSP biologists to reflect 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.

Results

Nest Survey

Fifteen nests were monitored in 1998. Fourteen of the nests were active, characterized by incubating eggs (Table 1). A housekeeping pair maintained the fifteenth nest. Nine nests were successful in producing 16 young, and one nest received a foster chick, for a productivity rate of 1.21 (young/active nest), slightly greater than that required for population maintenance (0.9-1.1 young/active nest). The number of nests has increased markedly over the last nine years (Fig. 1). All nests and potential sites are described individually below.

Alloways Creek

For their second nesting performance, this pair produced and fledged three offspring this year from the 1997 nest. The nest lies in a willow oak (*Quercus phellos*) adjacent to an active farm field. Incubation began on March 4, hatching on April 8, the three were banded on May 27 and fledging began on July 7.

Bear Swamp

The eagle pair at Bear Swamp built a new nest in a large tulip poplar (*Liriodendron tulipifera*) east of the old nest, which

blew out of the pond pine (*Pinus serotina*) in 1997. Despite the fact that the destroyed nest was reconstructed last winter by ENSP biologists and volunteers, the eagles moved. The pair began incubation on February 19, and exhibited brooding behavior on March 24. On April 30 an aerial survey revealed that the Bear Swamp eagles had one chick. At that time it was determined that the Bear Swamp eagles had one chick. A fledge date was not determined because foliage blocked observation of the nest.

Belleplain (East Creek Pond)

The Belleplain State Forest eagles reoccupied the nest - near East Creek Pond - built by ENSP staff in a pitch pine (*Pinus rigida*) near last year's damaged nest tree. The nest tree lies in a large pine-oak forest. Incubation began on approximately February 26 or 27. At the time of the April 30 fly-over ENSP biologists observed three eaglets in the nest. They were banded on May 13. All were in good health at that time. No further observations were made.

Cohansey River

This year the bald eagle pair on the Cohansey River was observed copulating on February 16 on the shore of the Cohansey River. They appeared to be moving toward a normal nesting season. Observations of one bird's presence at a time in late winter seemed to indicate incubation, but the pair was seen together again during this period. The pair was seen again on March 28 carrying and dropping sticks, not leading observers in any direction. Despite repeated aerial surveys, ENSP biologists found no evidence of nesting this year. The reason for their failure to nest is unknown.

Egg Harbor River

Mark Resciniti, this year's Egg Harbor River observer, reported seeing the pair copulating on an old osprey platform on January 31. Throughout February, their behavior was consistent with that of incubating eagles, but they were observed perched together again on March 5 and 6. No nest was located for this pair.

Galloway Township

This pair was observed at the nest in the pitch pine (*Pinus rigida*) adjacent to a clear-cut, where they nested last year. That nest suffered storm damage last September and was rebuilt by ENSP biologists on November 25, 1997. They were seen at the nest on several occasions in January and February, but the pair made no additions of material to the nest. By the middle of March, sightings of the eagles were sporadic and unpredictable. During an intensive search made by ENSP staff and volunteers on March 31, the location of the new nest was found. At the time of the discovery, the pair was incubating in the new nest in a pitch pine on a hummock adjacent to a tidal creek. On April 8, the new nest was abandoned, presumably due to human disturbance.

Horne Run (Mannington)

The Horne Run eagles returned to their 1994 nest atop a tall tulip poplar (*Liriodendron tulipifera*), lying between an active farm field and a tidal estuary. This pair has failed to produce young since their 1987 arrival in Mannington Meadows. The eagles started incubating on February 9. On March 12, ENSP biologists removed two eggs from the nest and fostered a fertile egg from a captive pair into the nest. The eagles returned to the nest two hours later and resumed incubation. The removed eggs were incubated artificially and one of them hatched on March 22. The chick took 54 hours to emerge from its shell. At no point did the chick solicit for or could it be stimulated to take food. The chick died after 22 hours. In 1995 and 1996, the pair briefly exhibited brooding behavior, suggesting hatching, but ultimately abandoned their nest. This year, they abandoned their foster egg on March 31. The chick's remains and the addled egg's contents were prepared for contaminant

analysis.

Lake Lenape

On April 7, ENSP biologists investigated reports from a fisherman of a nest on the Great Egg Harbor River. The biologists found an incubating eagle, on a nest built in a pitch pine (*Pinus rigida*), on an island in the river. Biologists witnessed disturbance of the nesting eagles by recreational activities on three occasions in one day and posted the area heavily as a result. The nesting eagles abandoned the area during the first week of May. On October 23, ENSP staff and volunteers built a new nest in a location safer from disturbance.

Maurice River

The Maurice River pair again nested in a pitch pine (*Pinus rigida*) at the forest-tidal marsh interface on the river. The eagles began incubating on March 1, and the young hatched around April 6. ENSP biologists banded one eaglet on May 14. The eaglet fledged around June 29.

Nantuxent Creek

The bald eagle pair reoccupied their nest in the tulip poplar (*Liriodendron tulipifera*) that lies on the edge of a fallow field adjacent to tidal marsh. The pair began incubating on February 23, and hatching began on March 31. ENSP biologists banded two young on May 19, and fledging occurred on June 22 and June 30.

Raccoon Creek (Delaware River)

The Raccoon Creek bald eagle pair initially returned to their 1996 nest on Raccoon Creek. They spent their mornings adding material to this nest and copulating on and around it. The Cleggs, who observe that nest, discovered that the pair was spending part of their afternoons adding material to their Delaware River nest. This behavior continued until March 1, at which time incubation began in the nest in the eastern cottonwood (*Populus deltoides*) on the Delaware. On April 6, a 10-day old eaglet was fostered into their nest and their lone egg was removed for contaminant analysis. When ENSP biologists returned on May 27, the eaglet was almost 9 weeks old and was banded and fitted with a radio transmitter, harnessed to her back. The use of the transmitter allowed for observations further into the season and will provide insight into some of this pair's critical habitat areas. Hope, as the eaglet was nicknamed, fledged on June 17. She was last seen on August 19.

Rancocas Creek

This pair used a new nest in 1998, built in a red oak (*Quercus rubrum*) nearby the nest they built in 1996. The Rancocas nest site, surrounded by nearby houses, is unique in New Jersey. This nest faces great potential for disturbance. Incubation began on February 9 and the pair stopped incubating on February 19. The female laid a second clutch and began incubating on March 1. Incubation ceased on March 24. Eggshell fragments, found near the nest tree, were collected for contaminant analysis.

Round Valley Reservoir

The bald eagle pair at Round Valley continues to be the only known nest in northern New Jersey. The eagles reoccupied their 1996 red oak tree (*Quercus rubrum*) nest near Round Valley Reservoir. ENSP biologists worked with the Division of Parks and Forestry to close a nearby trail during the nesting season in order to minimize disturbance. The pair was first

observed incubating on March 4, and brooding behavior was seen on April 6. The position of the nest in the tree prohibits biologists from climbing to band, and therefore, the two eaglets fledged without bands in early July.

Stow Creek

The eagles, which had nested in the large sycamore tree (*Platanus occidentalis*) for seven years, took their nesting activities to a nest in a sweet gum (*Liquidambar styraciflua*) which housed several great blue heron (*Ardea herodias*) nests. The eagles added material to the highest heron nest in the tree and began incubation on February 28. On April 4, hatchlings elicited brooding behavior from the adults and two eaglets fledged on July 1. Their new nest blew out of the tree two days before they fledged. The eaglets remained on the branches where the nest had been for those two days. The sycamore tree nest was home to ospreys (*Pandion haliaeetus*) again this year, and they fledged one offspring.

Supawna Meadows

A housekeeping pair of eagles was monitored on the Supawna Meadows National Wildlife Refuge throughout the season. This pair built their nest in a large silver maple (*Acer saccharinum*) in a hardwood swamp forest on the Refuge.

Union Lake

The eagles, in their fifth active nesting season, reoccupied their nest atop a large pitch pine (*Pinus rigida*) near Union Lake. The pair started incubating on February 19, and the young hatched on March 31. ENSP biologists banded one eaglet on May 14. A specific fledge date was not recorded for that bird, but took place in the beginning of July.

Wading River

This year proved to be the fourth successful breeding season for these eagles. The pair re-nested in a rather small pitch pine adjacent to an active cranberry bog. Incubation began on February 10. On March 18 two chicks hatched. Early in May, only one eaglet remained in the nest and that eaglet fledged on June 30.

Potential Nest Sites

ENSP biologists and observers actively searched for possible nesting bald eagles in several different locations. Most of the search was in response to the many reports of eagles engaging in behaviors typical of nesting birds. Areas, which look promising, are Merrill Creek, Alloway Creek, Mantua Creek and Oldmans Creek. In addition, several inland reservoirs and the Delaware Water Gap area, in northern NJ hold promise of eventual eagle nesting.

Raccoon Creek Telemetry Study

In addition to our usual bald eagle nest management, this year we began a multi-year radio telemetry study, which will help to define critical habitat to the Raccoon Creek nesting pair. Critical habitat is defined as the habitat that the eagles use for foraging, perching and roosting, activities in addition to nesting which are essential to the birds' survival and reproductive success. The use of radio telemetry enabled ENSP staff and volunteers to track the local movements of the eaglet after fledging. The equipment involved included a radio transmitter – worn by the eaglet – with a unique frequency, which emitted a steady pulsing signal and a radio receiver with a yagi antenna, which allowed the user to determine the direction of the signal.

Hope (nicknamed by Elmer and Bunny Clegg) fledged on June 17, but remained around the nest tree for several days. Her movements throughout the area gradually increased in frequency and distance from the nest. Elmer and ENSP personnel tracked Hope’s movements from dawn until dusk weekly. This tracking gave us an opportunity to witness behaviors and

occurrences that we would have otherwise missed. The following are some of the observations that Elmer and Bunny and ENSP personnel were fortunate to witness during this project.

On the morning of July 5, Elmer watched the male adult eagle land on the Delaware River bank and begin feeding on a fish which had washed ashore. Hope joined and ultimately displaced the male and began feeding on the fish. With her back to the water, she did not see that a large snapping turtle (*Chelydra serpentina*) had emerged from the river, heading for the fish. When she noticed, Hope yielded to the snapper, which claimed the fish and dragged it into the Delaware. A minute or two later, the fish returned to the surface of the water and Hope took the initiative and reclaimed it. It was temporary. Again, the snapper emerged from the dark water and again, Hope yielded the prize, but not before she tore off a big chunk for herself.

Proficiency in flight takes some time. On July 7, flying gracefully over the river, Hope turned and banked hard to the left. The tip of her wing touched the river and in a flash, she disappeared under the water. Hope had luckily crashed into shallow water. She raised her wings to the surface and swam to where she could stand. From there, Hope flapped hard and rose out of the water to a stump on the riverbank. For the next couple of hours, she preened and spread her wings open to dry.

Hope was seen on several occasions making what appeared to be attempts at fish capture. All the practice paid off on August 4. Hope lifted a fish from the Delaware River. That is a really encouraging observation, the ability to capture her own prey increases her chances of survival.

Hope was last seen on the evening of August 19. During the night of August 18, a cold front moved into the area and the following day was cool and very windy. All three of the eagles were very active that day. At one point I watched Hope make a weak strike toward a pied-billed grebe (*Podilymbus podiceps*) which had been swimming on the shore near the eagles' most used perch tree. For the first time since she fledged, Hope spent a considerable amount of time soaring. She was observed soaring with each of the adults and performing impressive aerial maneuvers with them and on her own. On several occasions that day, she and one of the adults would fly above one another and the lower bird would flip upside down and the two would touch their talons.

On August 19, Hope was in flight for more than an hour at a time. Most of that time she was soaring low. In the afternoon, the female adult began to soar and Hope joined her. Hope's altitude surpassed that of the female and then the tiny dot in the sky that was Hope disappeared. During that time her radio signal was decreasing in strength as she climbed. When the signal began growing stronger, I scanned until I found her. Hope was still a small dot in the clear blue sky, but she was getting larger. Soon I could easily make out her form and then I watched Hope tuck her wings in close to her body and begin plummeting straight down. She put her feet out in front of her and I lowered my binoculars for the whole picture. About 40 feet directly below her outstretched talons at that moment was a severely panicked double-crested cormorant (*Phalacrocorax auritus*). The cormorant dodged from one side to the other and then folded its wings and dived into the river. Hope extended her wings and very gracefully glided up and over to her favorite perch along the Delaware River.

At nightfall Hope and the adults were roosting locally. The following day nobody made any observations. On August 25, Elmer and I flew out of Woodbine Airport outfitted with our receiver and antennas and set out to find Hope, alas, to no avail. The adults returned to the area only a few days later.

Wintering Eagle Survey

A total of 121 bald eagles were observed during the midwinter survey on January 10 & 11, 1998 (Table 2). This count is 55 eagles short of last year's record of 176 (Figure 2). Southern NJ continued to host the majority of the state's wintering birds, perhaps due to large open water areas and relatively warmer temperatures.

Ninety-three bald eagles were counted in southern New Jersey, of which 43 were adults (Sutton and Elia 1998). The distribution of the eagles was: Delaware Bay watersheds (54%), the Atlantic Coast watersheds (31%) and the lower Delaware River (15%). The three transects with the highest numbers of sightings were Fortescue with 17, Maurice River with 16 and the Mullica River with 12 eagles counted.

The main sites for northern New Jersey's wintering eagles were the Delaware Water Gap (21%) and northern reservoirs (72%). Two eagles were counted at the Palisades-Hudson River route (7%).

Contaminants Research

ENSP biologists collected blood samples from eleven eaglets during banding procedures at six nests, including the Raccoon Creek nest. Blood was frozen within six hours, and samples were stored pending transfer to a lab for analysis of organochlorine compounds such as DDT, its derivatives and PCBs, and heavy metals such as mercury, cadmium and arsenic.

In 1998, ENSP biologists collected three eagle eggs for analysis, 1 from Raccoon Creek, taken when a captive-bred nestling was fostered, and 2 from Mannington Meadow (Horne Run) when we exchanged them for a captive-bred egg. The Horne Run eggs were collected March 12, about one week prior to hatching, and we incubated the eggs. One egg was already dead at collection, while the second pipped on March 19 and hatched on March 21. The hatchling survived just 2 days; it did not raise its head or take any water or food. This is the first opportunity we have had to see what may be happening in the wild; observers have reported apparent hatching, then abandonment (or a return to incubation) within 1-2 days. This hatchling will be examined, and will be part of our contaminant study. Analysis of these samples will be done in late 1998, and will be important to understanding the failures these eagles have experienced. Analysis of previous eggs (from Raccoon Creek and Stow Creek) was published in the journal, Bulletin of Environmental Contamination and Toxicology (Clark, Niles and Stansley, 1998).

Eggshell measurements for 1998 eggs suggest that DDT compounds may still affect eggs in the lower Delaware River region. The Raccoon Creek egg was 13.8% thin, slightly above the 1993-1997 average of 12.9% thin. The eggs from Horne Run nest were 16.8% thin (and did not hatch) and 6.5% thin (which did hatch). Eggshell fragments collected from the Rancocas Creek nest, after the eagles abandoned were 21.9% thin. Eggshell thinning above 15-18% thin has been associated with reproductive impairment in eagle populations.

Field observations of eagle nesting behavior and chronology continue to be vital to our study of how contaminants affect eagles. Volunteer observers have collected data that help us make the link with contaminant problems. Observations of nesting behavior and hatching chronology may allow us to correlate abnormalities with levels of PCBs in eggs.

Acknowledgments

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We wish to express our sorrow at the loss of George Conover, a kind man and a dedicated observer who always went above and beyond whatever we asked of him.

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Table 1. Production and significant dates of Bald Eagles nesting in NJ, 1998.

Nest Site	Incubation	Hatching	Banding	Fledging	# Fledged	Notes
Alloways Creek	3/4/98	4/8/98	5/27/98	7/7/98	3	-
Bear Swamp	2/19/98	3/24/98		6/16/98*	1	The pair built a new nest in a tulip poplar. Adults were observed at the new nest on 1/20/98
Belleplain	2/27/98	4/3/98*	5/13/98	6/26/98*	3	-
Galloway	3/31/98	-	-	-	-	This pair was found incubating on a new nest on 3/31/98. Abandoned 4/8/98
Horne Run	2/9/98	-	-	-	-	Nest abandoned on 3/31/98
Lake Lenape	4/7/98	-	-	-	-	Nest abandoned between 4/30 and 5/5
Maurice River	3/1/98	4/6/98	5/14/98	6/29/98*	1	-
Nantuxent Creek	2/23/98	3/31/98	5/19/98	6/22/98	2	-
Raccoon Creek	3/1/98	4/6/98**	5/27/98	6/17/98	1	** Ten-day old captive bred eaglet transferred to nest on 4/6/98
Rancocas Creek second clutch	2/9/98 3/1/98	- -	- -	- -	- -	Abandoned 1st clutch on 2/19/98 Abandoned 2nd clutch on 3/24/98

Round Valley	3/4/98	4/6/98	-	6/29/98*	2	-
Stow Creek	2/28/98	4/4/98	-	7/1/98	2	Pair built new nest which blew down on 6/28/98
Union Lake	2/19/98	3/31/98	5/14/98	6/23/98*	1	-
Wading River	2/10/98	4/7/98	-	6/30/97	1	-

* these dates are estimates based on the observed nesting dates.

Table 2. Bald Eagles counted in the NJ Midwinter Bald Eagle Survey, January 10&11, 1998

Region	Adults	Immature	Unknown	Total
South				
Delaware Bay	19	31	0	50
S. Delaware River	9	5	0	14
Atlantic Coast	15	14	0	29
North				
N. Delaware River	0	0	0	0
Delaware Water Gap	4	2	0	6
Inland Reservoirs	9	10	1	20
Palisades	2	0	0	2
Total South	43	50	0	93
Total North	15	12	1	28
Total Statewide	58	62	1	121

Figure 2. Midwinter Bald Eagle Counts 1978 - 1998.

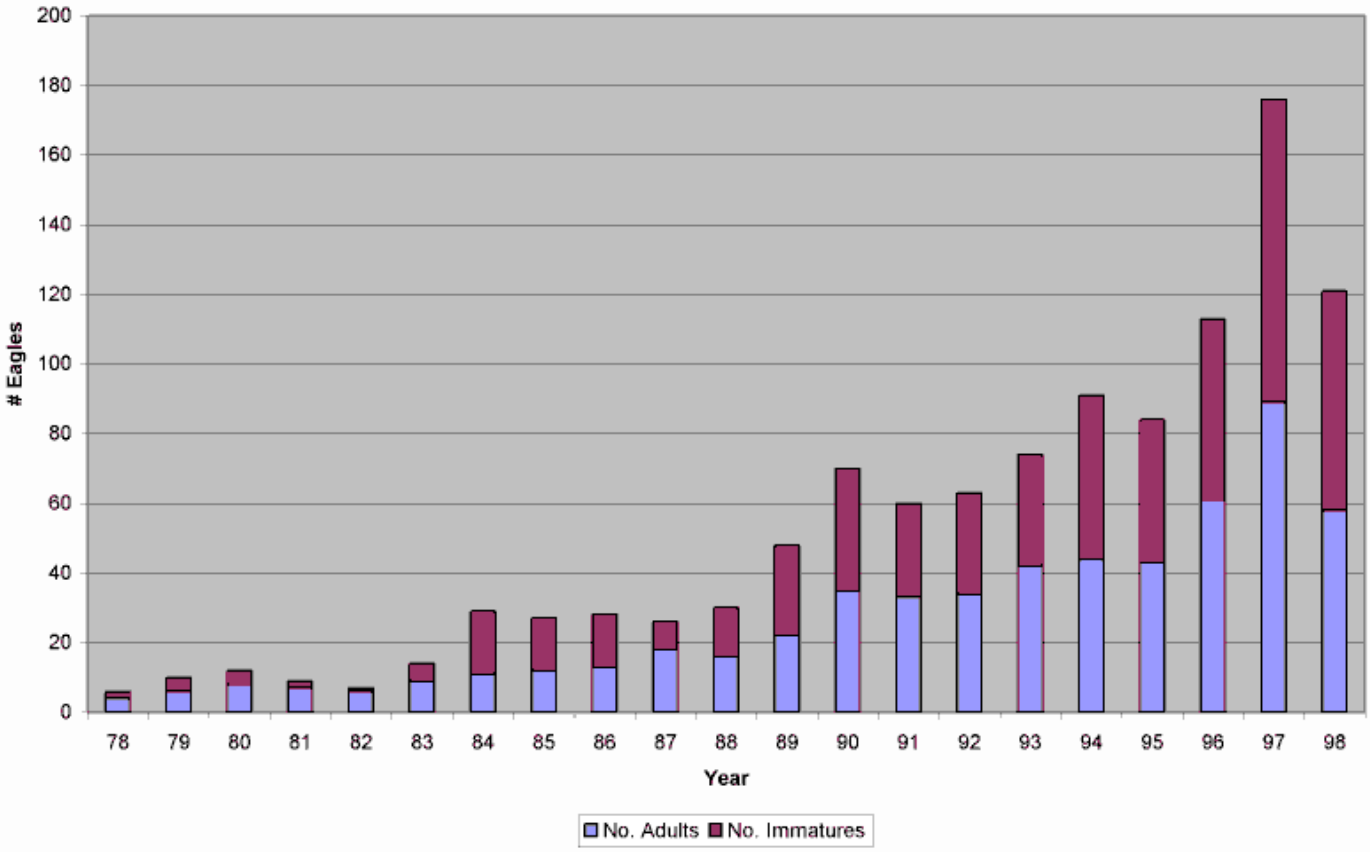
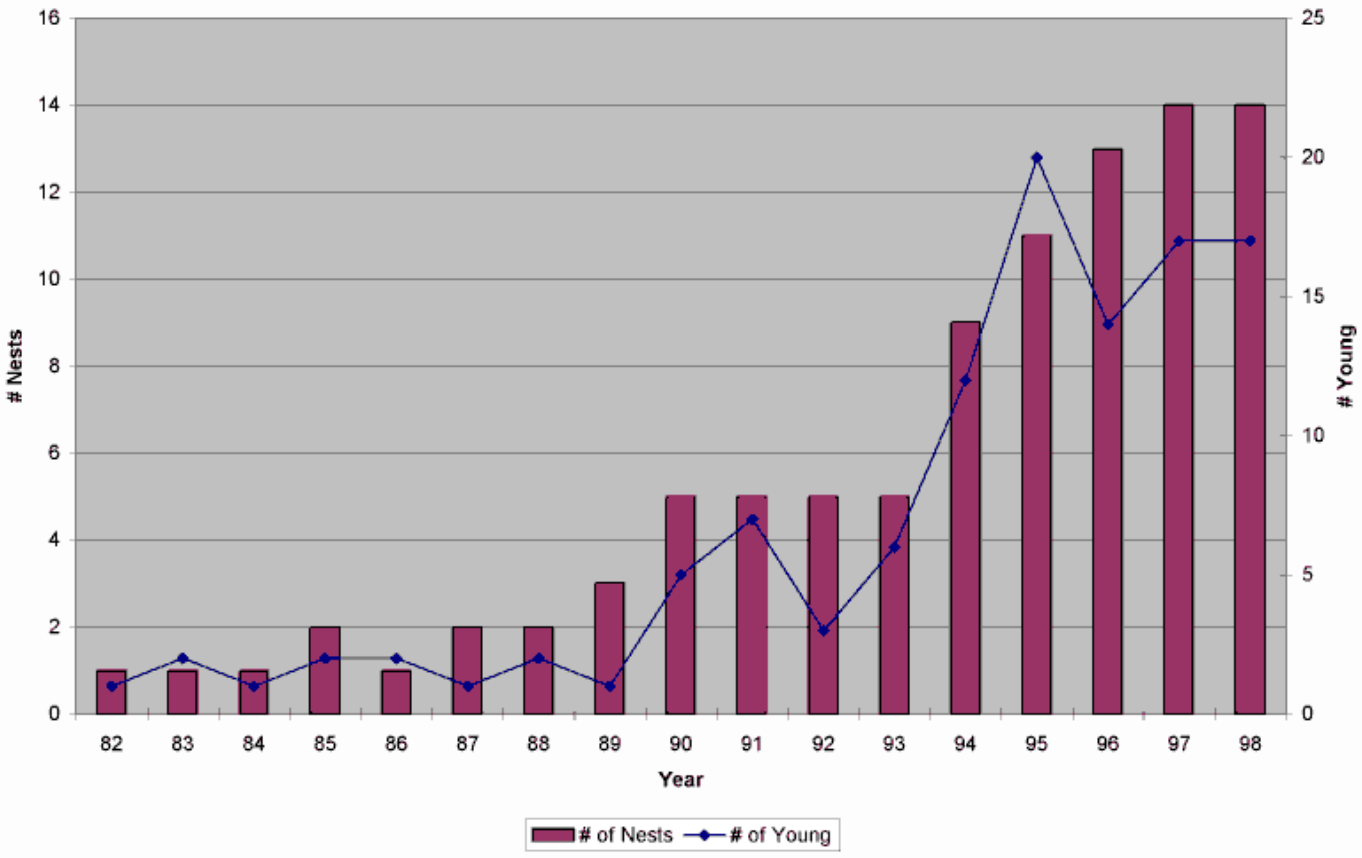


Figure 1. Bald Eagle Nests and Young in NJ, 1982 -1998.



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