

The Story of the Eagles at Bear Swamp

Theme: Natural History

Authors: Christine R. Raabe

Education Consultant

Eric Stiles

*NJDEP, Division of Fish, Game and Wildlife
Endangered and Nongame Species Program*

Subject Areas

Language Arts, Science, Mathematics

Duration

One or two class periods

Setting

Indoors

Skills

Interpreting, analyzing, describing,
inferring

Charting the Course

The vast amount of open space and diversity of habitat that exists in the region Down Jersey contribute to the high incidence of endangered species in the area. In particular, of the 15 known bald eagle nests in the state, 14 of them are found in southern New Jersey. More significantly, the oldest known nest (since bald eagles have been managed by the Endangered and Nongame Species Program) is located in Bear Swamp.

Vocabulary

Fledging, incubation, hacking,
endangered, threatened

Correlation to NJ Core Curriculum Content Standards

Language Arts	Mathematics
3.1 (7, 8, 13)	4.1 (1, 2, 3, 5, 8)
3.2 (2, 6)	4.2 (1, 2)
3.3 (1, 3, 4, 6, 8)	4.3 (6, 7)
3.5 (4, 5, 6, 8)	4.4 (2, 5, 10)
	4.11 (2, 5)
Science	4.12 (1, 3, 4, 5)
5.2 (5)	
5.5 (4, 10)	
5.6 (5, 11)	
5.12 (1, 2, 3, 4, 5, 6, 7)	

The Story of the Eagles at Bear Swamp

■ Objectives

Students will be able to:

1. Describe some of the characteristics of bald eagles.
2. Explain the cause(s) of the bald eagle becoming endangered in New Jersey.
3. Interpret scientific data collected for a particular nest located at Bear Swamp
4. Utilize the scientific data to create and write a biography about the "Eagle Family of Bear Swamp."

■ Materials

Photos/pictures of the bald eagle (may use field guides, encyclopedias, etc.)

Copies of the data sheet for Bear Swamp

Writing materials

Art supplies (optional)

■ Making Connections

Endangered species seem to hold a special appeal to students. Frequently, the species studied in schools are somewhat exotic and include such things as panda bears and manatees - neither of which is found in New Jersey. New Jersey does have a significant number of endangered and threatened species that are found within our borders. The southern part of the state, rich with open space and a wide variety of habitats, plays a critical role in providing for the state's endangered species.

Specifically, the bald eagle has found a home in the region called Down Jersey. Of the fifteen nesting pair of eagles in New Jersey, fourteen of them are in the southern part of the

state. The connections that exist in the region between people and the natural environment are evident throughout the film and in the example of the bald eagle and endangered species, people take an active role in their protection and management.

■ Background

Excerpts from New Jersey Bald Eagle Project, 1997, annual report of the Endangered and Nongame Species Program prepared by Eric Stiles, Kathleen Clark, and Lawrence Niles.

The bald eagle population in New Jersey has increased from a single nest in the 1970's and early 1980's to fourteen active pairs in 1997. Endangered and Nongame Species Program (ENSP) biologists have monitored the nesting and wintering populations each year since 1980, and implemented a recovery strategy to increase the productivity and range of nesting, to bring the bald eagle back from the brink of extirpation.

In 1982, after Bear Swamp, New Jersey's only active bald eagle nest, had failed at least six consecutive years, ENSP biologists removed the egg for artificial incubation, and fostered the young back to the nest. This technique compensated for the contaminant problem that caused the eggshells to be too thin to withstand incubation. It was 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 much as 80%), and they do not nest until four or five years of age. The ENSP instituted a hacking project in 1983 that resulted in the release of 60 young eagles in New Jersey over an eight year period. (Hacking is the process of implanting healthy eggs [i.e., not contaminated with residual DDT] into the eagles' nest.) These eagles have contributed to the increase in nesting pairs since 1990.

Bald eagles nesting in New Jersey face many threats: disturbance is the greatest problem, as people are naturally attracted to the sight of eagles. 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 New Jersey, 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 and land acquisition experts, and through the state's land use regulations. The 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. The ENSP monitors these species during



The Story of the Eagles at Bear Swamp

the nesting season to evaluate nest success and assess any problems that occur.

The population of wintering bald eagles has grown along with the nesting populations, especially in the last nine years. This growth reflects increasing nesting populations in New Jersey and the northeast, as each state's recovery efforts pay off. In recognition of this success, the federal government upgraded the status of the bald eagle from endangered to threatened in July of 1995. 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.

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. 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.

For further information on the eagle project and a copy of the latest annual report, or other efforts for the protection and management of endangered species in New Jersey, contact

*the ENSP at (609) 292-9400. Ask for a copy of the films and videos they have available for schools to borrow. Specifically, **Back from the Brink** is a New Jersey Network special documentary that focuses on the bald eagle, osprey, and peregrine falcon and their recovery in New Jersey.*

■ Procedure

Warm Up

Discuss endangered species with the students. Have them research the causes of animals to become endangered. Can they name any endangered species? Tell them that the bald eagle is an endangered species in New Jersey. Have the students describe what a bald eagle looks like. Show pictures if available. Share some of the **Background** information with the class. Tell the class that there are bald eagles that nest in the Down Jersey region.



The Activity

1. Divide the class into groups of three or four students.
2. Distribute the Bear Swamp Bald Eagle Data Sheet included with this activity to each of the groups.
3. Have the groups define the words hacking, incubation, hatching, banding, and fledging.
4. Using the data, have each group create a graph that shows the number of eaglets fledged each year.

Using the graph, have them answer the following questions:

- a. What years were there two eaglets fledged from the Bear Swamp nest?
 - b. During what time period were no eaglets fledged from this pair?
 - c. How many eagles have been produced from this nest between 1972 and 1997?
 - d. What is the average number of eaglets produced each year by this pair/nest?
 - e. If an eagle usually lays between two and three eggs, what could be some possible reasons for not all of the eggs hatching?
 - f. When do eagles lay eggs? (What month?)
 - g. What is the average incubation period?
 - h. About how old are eaglets when they fledge (first fly)?
 - i. How old are the birds when they are banded?
5. Tell the students that every known nest in New Jersey is monitored from January through July. Volunteer

The Story of the Eagles at Bear Swamp

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. Tell the students that they are now going to pretend that they are the nest observers for the Bear Swamp nest.

- Based upon the graph and other data and information given, groups should begin to formulate a list of sequential events (imaginary or actual) that fit together into a tale about the eagles at Bear Swamp. For example, the eagles could each be named, circumstances and events that describe an eagle's life cycle and natural history could be explained, etc. Working cooperatively, each group should create a story about this family of eagles. Actual data should be incorporated as much as possible; however, the emphasis should be placed on creative writing and imagination. Students can draw or paint pictures to include with their stories.

Wrap Up

Each group should share their story with the rest of the class. This could mean simply putting them on display in the classroom, or having each group read aloud. These stories could also be presented using drama and props where group members act out the story.

Action

Find out about the "Adopt-A-Species" Program by calling the NJ Division of Fish, Game and Wildlife's Endangered and Nongame Species Program at (609) 292-9400 and help a specific eagle's nest (perhaps the one in Bear Swamp).

Hold an "Endangered Species Awareness Fair" and educate the school and community about the endangered species of New Jersey and the Down Jersey region.

Assessment

Student participation in the graphing and question portion. Also, involvement and participation in the group activity of creating the story and its presentation.

Extensions

Have small groups of students (or as a class) brainstorm a list of possible threats to eagles and eagle nests in New Jersey (i.e.; encroaching development and land use such as a strip mall or residential neighborhood, proximity of the nest to road construction, unknowing photographers and bird watchers getting too close, dirt bikes using the trails through the woods, etc.). Now, come up with a scenario where an eagle nest is being threatened by several of the things from the list generated. A map may be drawn to model the nest and surrounding vicinity. Challenge the students to hypothesize various ways to solve the problems that threatened the productive success and well

being of the eagle nest. This could be developed further with students role playing a town meeting to address the issues.

Also see **Action** at left.

Resources

New Jersey Division of Fish, Game and Wildlife, Endangered and Nongame Species Program

PO Box 400

Trenton, NJ 08625-0400

or visit the Division's website at www.state.nj.us/dep/fgw.

The Raptor Center has some wonderful resources. Check out their lesson plans by visiting their website at <http://www.raptor.cvm.umn.edu/newwebdev/meeen/meeen/connect.html>

Phone: (612) 624-4745

Fax: (612) 624-8740

Find out more about the local efforts currently going on to protect other endangered and threatened species in your area. Utilize the plans included and build an osprey platform and donate it to a group that will install it.

Contact:

Citizens United to Protect the Maurice River and Its Tributaries, Inc.

PO Box 474

Millville, NJ 08332.

New Jersey Audubon Society

Cape May Observatory

PO Box 3

707 East Lake Road

Cape May Point, NJ 08212.

(609) 884-2736



Student Data Sheet

The Eagles at Bear Swamp

Year	# Fledged	Incubation	Hatching	Banding	Fledging	Comments
1972						No birds at nest
1973						No birds at nest
1974	2					
1975	1					
1976	1					
1977	0					
1978	0					
1979	0					
1980	0					
1981	0					
1982	1					
1983	2					
1984	1					
1985	2					
1986	1					
1987	1	2/28/87	4/4/87	5/27/87	6/27/87	One egg lost due to hydration
1988	2	2/26/88	4/12/88	5/26/88	6/25/88	Two hacked eaglets
1989	1	2/28/89	4/4/89	5/18/89	6/1/89	Eaglet hacked from Chesapeake
1990	1	3/5/90	4/16/90		7/2/90	
1991	1			5/24/91		
1992	1					
1993	2	2/27/93	4/4/93	5/28/93	6/27/93	
1994	1	2/28/94	4/4/94	5/20/94	6/29/94	
1995	2	2/25/95	4/1/95	5/23/95	6/25/95	
1996	1	2/22/96	3/28/96	5/9/96	6/20/96	
1997	0	2/25/97	3/9/97			Nest blew down in storm 3/23/97 Eaglet to Raccoon Creek

From the 1997 report:

The eagle pair at Bear Swamp continued to use the oldest active nest in the state. The nest sits atop a large pond pine (*Pinus serotina*), lying in a large contiguous wetland forest. The pair began incubation on February 5, and exhibited brooding behavior on March 12. The nest observer reported the nest missing on March 28, a casualty of high winds. ENSP biologists and nest observers found one surviving eaglet atop the nest remains at the base of the tree on March 29. The Toms River Avian Care facility ensured the health of the eaglet, which was fostered into the Raccoon Creek nest on April 3. ENSP biologists and nest observers rebuilt the nest in Bear Swamp in December.