

PEA ISLAND NATIONAL WILDLIFE REFUGE
Rodanthe, North Carolina

ANNUAL NARRATIVE REPORT
Calendar Year 1979

NATIONAL WILDLIFE REFUGE SYSTEM
Fish and Wildlife Service
U. S. DEPARTMENT OF THE INTERIOR



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I. GENERAL

A. Introduction

Pea Island National Wildlife Refuge is a 5,915 acre coastal barrier island located on the Outer Banks of North Carolina. The refuge was established in 1938 and extends 13.5 miles from Oregon Inlet southward to the village of Rodanthe. An additional 25,700 acres of adjacent waters in the Pamlico Sound are closed by Presidential Proclamation to waterfowl hunting.

In 1937 a Congressional Act was passed establishing the Cape Hatteras National Seashore. This Act recognized Pea Island and provided that it would be administered as a National Wildlife Refuge. The remainder of the seventy-five miles of the seashore would be administered by the National Park Service as a recreation area. Currently there is a joint agreement in effect between the U. S. Fish and Wildlife Service and National Park Service for cooperative effort in handling the interpretive and recreational programs on the refuge and the wildlife management practices on the Seashore.

B. Climate and Habitat Conditions

The weather conditions for 1979 were normal for this area. January and February were predictably the coldest months with a 3-4 inch snowfall occurring in February.

Precipitation for the year totalled 56.08 inches which is about 4.78 inches above normal. These wet conditions provided water for the impoundments year round and aquatic plant production was excellent.

The ever present beach erosion continued at an average annual rate of approximately 13 feet and consequently the beaches remained closed to vehicles throughout 1979.

C. Land Acquisition

1. Fee Title

N/A

2. Easements

N/A

3. Other

N/A

D. Systems Status1. Objectives

The initial purpose for the refuge was to provide wintering habitat for the greater snow goose. That objective has expanded to include wintering habitat for all species of waterfowl. In 1979 browse areas were planted to increase use days by both snow and Canada geese. Clearing of brush and cover type planting was done to enhance waterfowl use.

More recent objectives deal with management for wildlife diversity and protection of unique refuge habitats. Positive action toward achieving these goals was taken when off-road vehicles were eliminated from the beach this year. This year also produced potential threats to these objectives. Those threats included: the Corps of Engineers proposed Oregon Inlet stabilization project; the Cape Hatteras Electrical Co-op's proposed upgrading of existing powerlines through the refuge; and N. C. Highway Commission's proposed upgrading of Highway 12.

The fourth objective is to provide for wildlife oriented and interpretative activities on the refuge. This effort is jointly handled through a cooperative agreement between the National Park Service and Fish and Wildlife Service. The level of effort remained the same as past years; however, the communication between the two agencies has improved.

2. Funding

The refuge budget increased for fiscal year 1979 by \$7,000. This increase was in Migratory Birds (1210). Funding in Endangered Species (1400) and Interpretation and Recreation (1240) remained the same even though visitation increased and work efforts dealing with endangered species increased.

A BLHP project for the bulkheading of 5,100 feet of dike went out on bids twice but no bid was acceptable. A breakdown of funding history is as follows:

	<u>1210</u> <u>Migratory Birds</u>	<u>1400</u> <u>Endangered Species</u>	<u>1240</u> <u>I&R</u>	<u>FY</u> <u>Total</u>
FY-79	77,000 (335,000)	1,000	16,000	94,000 (335,000)
FY-78	70,000	1,000	16,000	87,000 (31,500)
FY-77	52,500 (33,400)	1,000	10,000 (2,000)	*67,700 (35,400)
() BLHP Monies		* Includes \$4,200 sale of equipment		

II. CONSTRUCTION AND MAINTENANCE

A. Construction

In October of 1979 the refuge acquired a much needed boat. Previously the only watercraft had been a 14' feathercraft and a 10 hp Mercury. For work and patrol in the refuge's 25,700 acres of shallow sound waters, a 20' Privateer and a 140 hp Evinrude motor with jet drive was purchased. This piece of equipment can operate in waters less than one foot in depth at speeds in excess of 30 mph.

A 7' cut John Deere 709 rotary mower was purchased to replace the old 5' cut mower.

A Chevrolet 4x4 pickup purchased with FY '78 wildlife resources funds was delivered in June of 1979.

A root rake for the D-3, ordered in 1978, was delivered in 1979. It did a good job clearing myrtle bushes to provide better waterfowl habitat.

There was no new construction or major rehabilitation done on the refuge in 1979.

B. Maintenance

The quarters were painted and readied for occupancy in 1979 and an additional 6" of attic insulation was installed. The usual routine maintenance on equipment and signing was carried out. Ground work was set for the re-posting of the Proclamation Boundary in Pamlico Sound. A permit from the Corps of Engineers and a new survey had to be set up. The actual posting will occur in the spring of 1980 by the Corps of Engineers in accordance with an in-kind-service agreement in payment for a one acre dredge docking facility located on the refuge.

C. Wildfire

No wildfires occurred on the refuge in 1979.

III. HABITAT MANAGEMENT

A. Croplands

The 50 acre New Field area was replanted with 2,000 lbs. of Kentucky 31 fescue and ten tons of fertilizer. A small stand of fescue planted in 1977 survived and with the additional disking and re-seeding this year a good stand of browse was obtained. The area received heavy useage throughout the fall and winter by Canada geese and to a lesser degree by snow geese. Two additional areas of approximately 2½ acres each were planted opposite South Pond and were utilized to a moderate degree by blue geese.



Disking up myrtles to enhance natural grass production for waterfowl.



Canada's feeding on the fescue browse planted in New Field.

B. Grasslands

N/A

C. Wetlands

Until such time as the BLHP rehabilitation of the impoundment water control structures occurs, the ability to manipulate and maintain suitable water levels and salinity's will remain subject to the whims of the elements. Due to higher than normal rainfall in 1979, the impoundments maintained an acceptable water level throughout the year and aquatic food production was good. However, the high winter winds caused serious wave action erosion to the dikes.



Damaging wave action on North Pond bulkhead during a winter storm.

Approximately 10 acres of brush was cleared adjacent to North Pond and volunteer (Scirpus sp.) replaced the former myrtle thickets creating good feeding for snow geese. Cattail encroachment in South Pond was slowed by disking with the D-6 but water levels were too high to do an effective job.

No burning was undertaken in 1979.

D. Forestlands

N/A

E. Other Habitat

The areas of ocean beach barrier dunes and high sand ridges contain approximately 1,600 acres. These fragile areas are not subject to active management. However, protective measures such as prohibitive signing and patrol are taken to prevent vehicle traverse, camping, fires, and subsequent damage.

F. Wilderness and Special Areas

Numerous small islands in the sound totalling approximately 180 acres have been proposed for wilderness status but no final approval has been received.

G. Easements for Waterfowl Management

N/A

IV. WILDLIFE

A. Endangered and/or Threatened Species

1. Atlantic Loggerhead Sea Turtle

Listed as threatened on the national scope and endangered by the State of North Carolina, the loggerhead utilizes Pea Island's beaches for nesting. In 1979, there were ten nests on the refuge with the first occurring on June 4, 1979 and last being laid on July 30, 1979. Of these ten, seven were relocated to a protected enclosure. Two of the beach nests were lost to erosion and one hatched successfully. The seven nests in the enclosure produced 632 young turtles from 890 eggs. The egg transplant program in which nests were relocated from Cape Romain NWR to Pea Island began in 1972 and terminated in 1978.

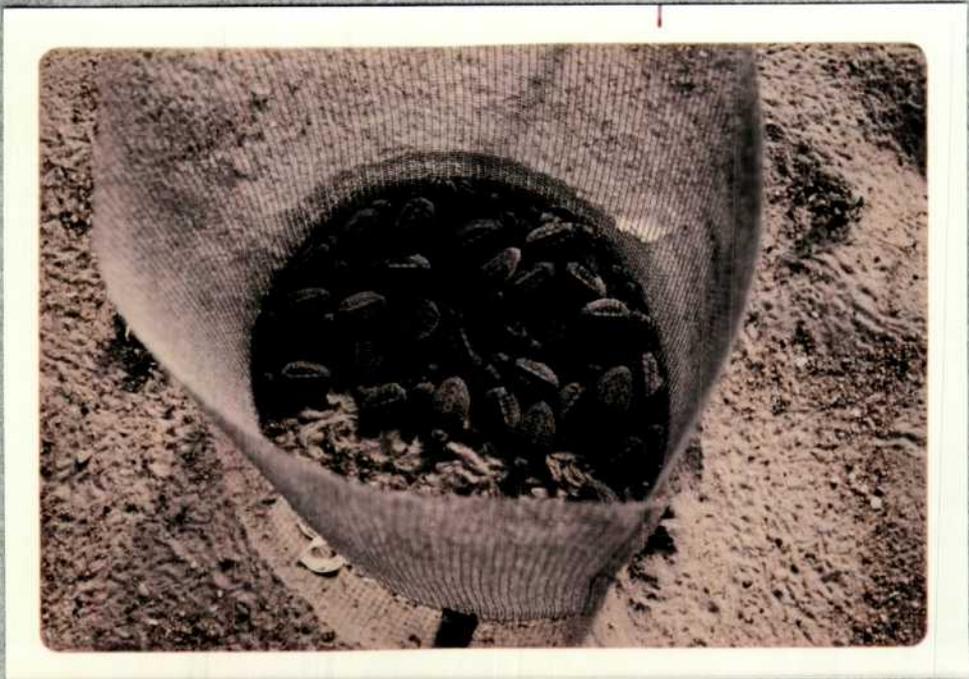
The National Park Service contacted refuge personnel about two nests located in high public use areas and these were brought to the enclosure. Of these 173 eggs, 126 hatched. One of these nests contained only 40 eggs and was incubated in a 5 gallon bucket of sand with fair success. (See photos on page 7).

One 200+ pound loggerhead was removed from a fisherman's net by refuge staff. It was transported and released in the ocean.

The sea turtle recovery team met at Pea Island to review the proposed jetty project for Oregon Inlet and its effects on the nesting habitat of loggerheads. All were in concurrence that if the project were implemented, several miles of refuge and Park Service beaches would be unfit for nesting.



Released hatchlings on their own.



Hatchling turtles in a protective enclosure prior to their release.

2. Brown Pelican

While rarely seen a few years ago, eastern brown pelicans are a common summer and fall sight on the refuge. On October 15 approximately 300 pelicans were sighted along the refuge's beaches.

3. Peregrine Falcon and Eastern Merlin

The fall raptor migration was truly spectacular this year with an estimated 200 peregrines moving through the refuge. A group of wildlife students from N. C. State University counted 23 different peregrines on the refuge in one day. Two birds chose to linger and remained on the refuge. They were sighted regularly from early October until mid-January of 1980.

The State of North Carolina lists the eastern merlin as threatened. There were approximately 400 merlins utilizing Pea Island during their migration which peaked in mid-October.

4. Bald Eagle

The refuge was visited by an immature bald eagle in April and May but the territorial harassment by nesting red-winged blackbirds and eastern kingbirds became so frequent that he moved on. Another eagle sighting occurred in September over the North Pond impoundment.

B. Migratory Birds

1. Waterfowl

In 1979 the waterfowl census was done on a regular weekly, ground count, basic and monthly from the air. The surveys begin in mid-September and continue until the last of March.

The following is a breakdown of population trends for the 1979 waterfowl season:

- a. Canada goose usage of the refuge peaked with 5,650 birds, a 366% increase over 1978's peak.
- b. Snow goose populations peaked with a total of 11,300 birds. This was a 16% increase from 1978. (See photo on page 9).
- c. Whistling swan wintering populations had a high of 3,600 which was a 600% increase over the 600 birds recorded at 1978's peak.



Snow geese feeding in Salt Flats.

- d. The total duck peak population was 40,785. This was a 207% increase from last year.
- e. The coot population peaked with 3,500 birds, a 184% increase.
- f. All peak populations occurred during the month of January in 1979. The following table provides a comparison of peak populations for a five year period.

<u>Year</u>	<u>Swan</u>	<u>Snow Geese</u>	<u>Canada Geese</u>	<u>Ducks</u>	<u>Coots</u>
1979	3,600	11,300	5,650	40,785	3,500
1978	600	9,505	1,540	19,650	1,900
1977	600	12,325	4,500	14,000	690
1976	300	10,000	7,000	22,200	2,500
1975	2,100	10,150	9,000	35,876	10,000

- g. The total waterfowl use days for CY 1979 was 2,872,560. This was a 44% increase over 1978. In the first quarter of 1979, the total duck use was recorded as an exceptionally high 1,793,730 use days. This figure contributed significantly to the yearly increase for ducks and the same high use day figures applied to the first quarter goose populations. These high figures are attributed to the cold weather in the northeast during January and February.

The following table provides a use day comparison for a 5 year period.

<u>Year</u>	<u>Swan</u>	<u>Snow Geese</u>	<u>Canada Geese</u>	<u>Ducks</u>	<u>Coots</u>
1979	144,360	397,140	277,560	1,896,900	156,600
1978	23,580	335,010	83,940	1,101,300	88,110
1977	21,000	362,400	246,270	834,570	28,770
1976	48,930	491,640	270,990	1,676,820	544,440
1975	50,100	702,030	543,510	2,834,310	404,730

The five year comparisons are shown graphically for total waterfowl use days on graph 1, page 11 and total waterfowl peak populations on graph 2, page 12.

- h. The banding program went well this year. The banding quotas were 200 black ducks and 50 mallards. In addition, every fifth black duck was also banded with a \$15.00 reward band in cooperation with the North Carolina Wildlife Resources Commission. The following is a summary of banding results.

<u>Species</u>	<u>Number Banded</u>
Black Duck	201
Mallard	87
Pintail	22
Wigeon	05
Redhead	12
Green-winged Teal	03
Hooded Merganser	03

C. Waterfowl Production

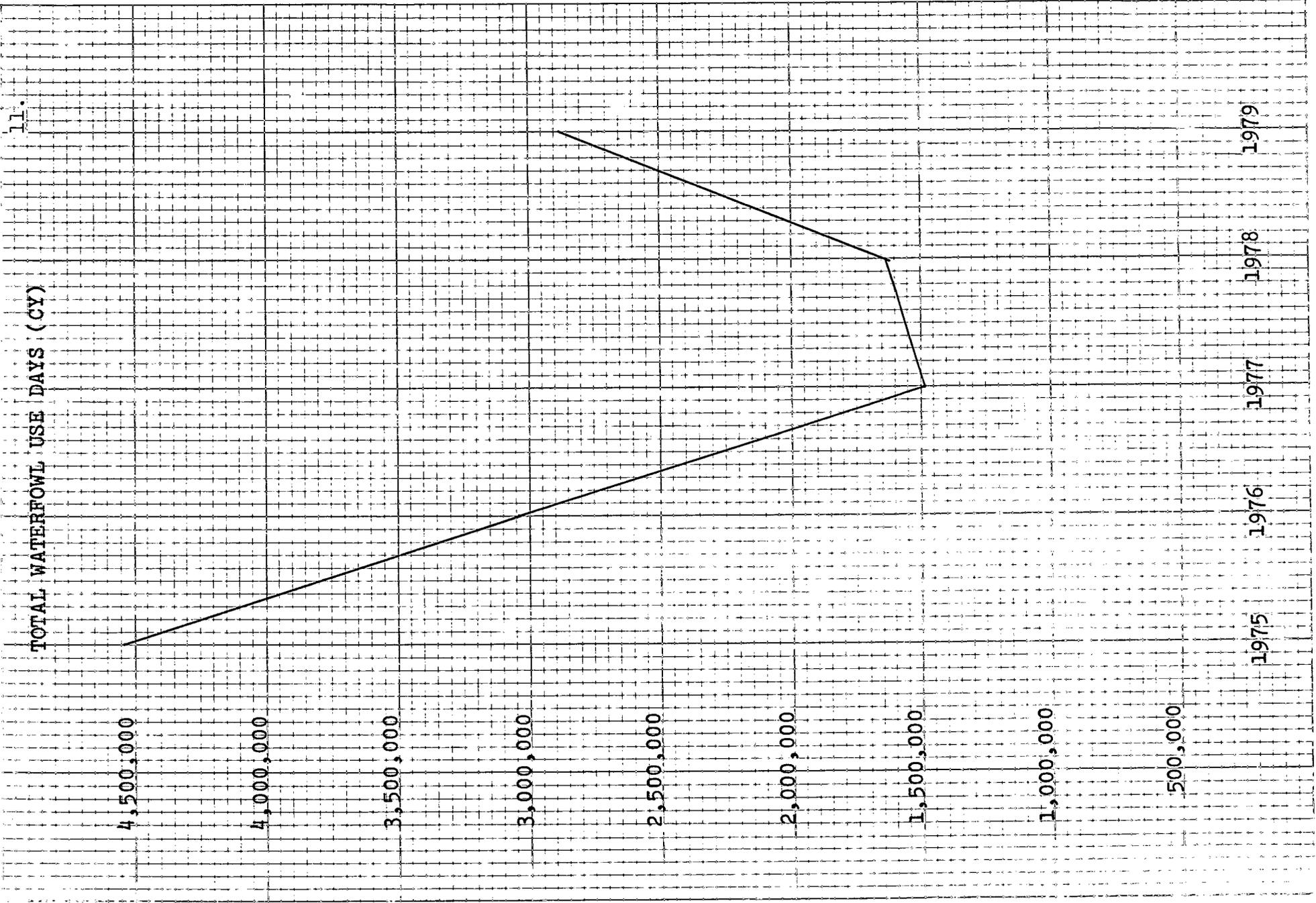
1. The refuge provides nesting habitat for a small population of gadwall and black ducks. This year five broods of green-winged teal were also noted.

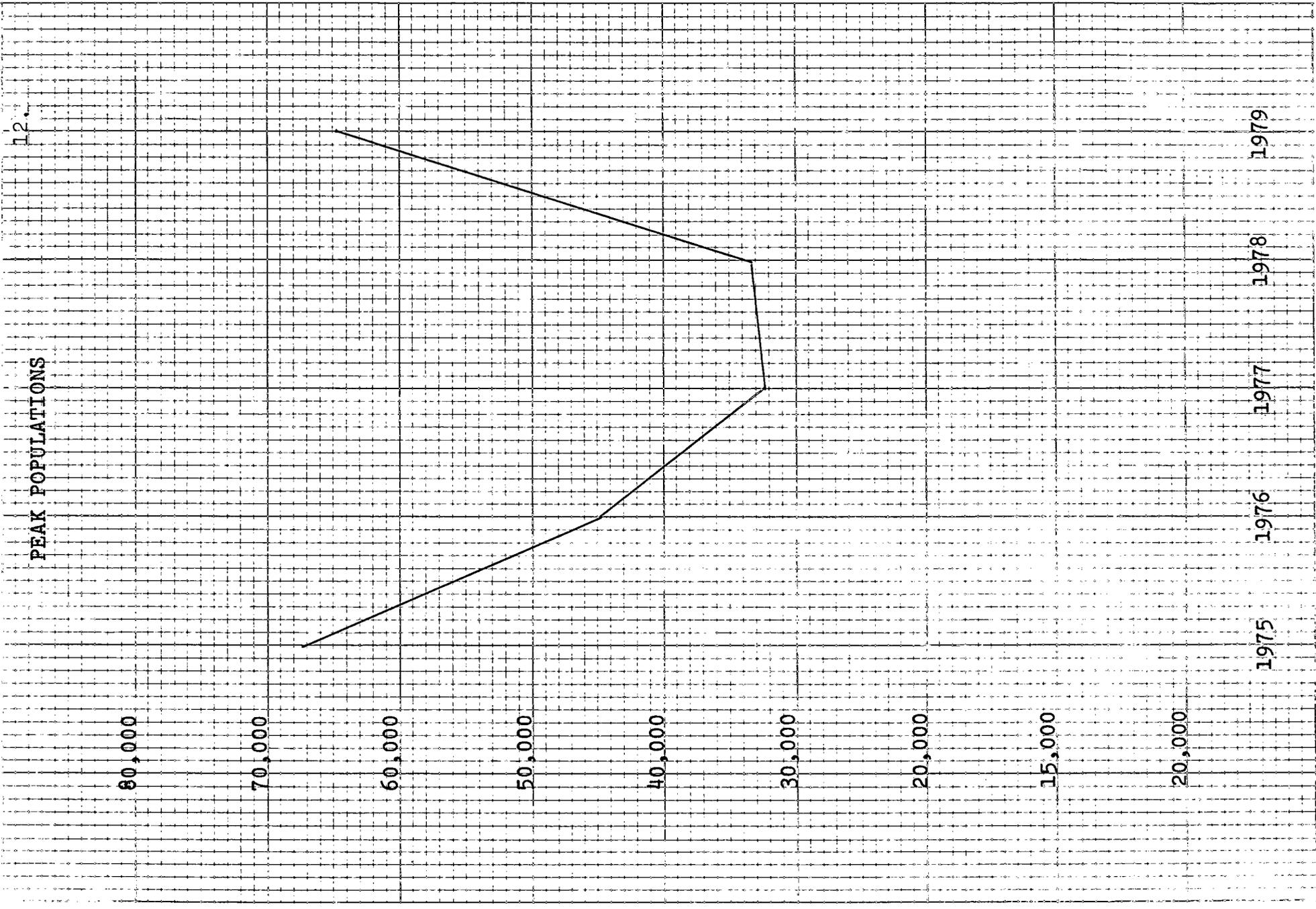
Black duck production was good with an estimated 130 pairs of birds producing 520 young. This was a significant 246% increase over 1978's production of 150.

Nesting gadwalls numbered an estimated 115 pairs producing approximately 460 young. This was a 130% rise over the 1978 figure of 200.

The small number of green-winged teal which nested on the refuge produced an estimated 45 young from 15 pairs of birds.

The increase in waterfowl production can be directly attributed to the increased rainfall which kept the impoundments and potholes nearly full throughout the year.





2. Marsh and Water Birds

The marshes and impoundments of Pea Island are heavily utilized by marsh and water birds for feeding and nesting.

A table of comparison showing a five year period of marsh and water bird use is included.

<u>Year (CY)</u>	<u>Use Days</u>	<u>Peak Populations</u>
1979	584,635	10,902
1978	450,057	5,185
1977	457,967	8,988
1976	339,362	9,942
1975	329,662	9,335

The increase in use days by 29% and peak populations by 110% again is attributed to a large degree by the high water levels on the refuge.

The islands in North Pond supported three rookeries this spring. Although no formal census was conducted, the following is a listing of nesting species and estimated production:

American Egret	100
Snowy Egret	110
Little Blue Heron	120
Black-crowned Night Heron	30
Yellow-crowned Night Heron	10
Louisiana Heron	40
Glossy Ibis	100
White Ibis	6

In more isolated locations in the marshes and on the dikes, green herons raised about 30 chicks.

3. Shorebirds, Gulls, Terns and Allied Species

In 1979 there were two colonies of least terns and one of black skimmers on the refuge's beaches. One colony of approximately 30 pairs of least terns was located opposite the North Pond impoundment on an area which had once been the road bed of Highway 12. This colony was active for approximately 1½ months and produced an estimated 20 young before being wiped out by storm overwash. The other nesting colony was located approximately 3 miles south of the refuge headquarters on a section of high beach which had an extraordinary amount of shell fragments in the sand. Along with the approximately 50 pairs of least terns, 20 pairs of black skimmers used this site. The area produced 40 young terns and 20 skimmers during the 2½ months it was utilized.

Both of these nesting areas were posted as closed areas and patrolled regularly to ensure minimal disturbance to the birds.

Dredge spoil islands in Oregon Inlet and Pamlico Sound were heavily used for nesting by terns and skimmers but they all lie outside the refuge boundary and were not censused.

The closure of the beach to ORV use in 1978 greatly enhanced its attractiveness to shorebird use in 1979.



Public use on the refuge beaches. (1978)



Closure of the beach to ORV use.



Pea Island's wild beach with no ORV use.

4. Raptors

As mentioned in the endangered species section, the fall raptor migration was magnificent. Sharp-shinned hawks were swooping in and out of any given cluster of brush. Marsh hawks patrolled the dunes and dikes and peregrine falcons perched on power poles. The peak of the migration was in mid-October for most raptors with the kestrels arriving in force in early December.

Ospreys were frequently seen feeding in the impoundments and offshore. The nesting platforms in North Pond had a nesting attempt but no young birds were seen. One nest was built on an old telegraph pole in New Inlet but, again, no young birds were observed.

5. Other Migratory Birds

The brushy areas, especially along the impoundment dikes, are a heaven for nesting and migrating song birds. With 265 species as regular visitors throughout the year. The 1979 Christmas bird count noted 81 different species of birds, not including migratory waterfowl. If migratory waterfowl was added, the total would come to 105 species. Considering the count was done in 50 degree weather with a 15 mph NE wind, quite a species diversity was noted.

D. Mammals, Non-Migratory Birds and Others

1. Game Mammals

The muskrat and nutria populations are doing very well. Serious damage is occurring to the impoundment bulkheads and dike berms from the burrows of these creatures. Cold weather kills a few nutria but at present, the highway traffic is the only population reducer.

Cottontail rabbits are frequently seen and often killed on the highway. 1979 was a good production year.

The otter population seems to be healthy. There is plenty of "sign" but actual animal sightings are rare.

2. Other Mammals

The feral cat population has been a historic problem on the refuge. This year was no different; however, a stronger policy for the solution of the problem was taken and an active cat trapping program instituted. Live traps are used (Hav-a-heart) to ensure no other animals are harmed. The trapped cats are permanently removed from the population.

Marine mammals occasionally wash up on the beach and when possible, qualified personnel are notified for scientific salvage.

3. Resident Birds

The ring-necked pheasant population is doing very well. A cyclical species, the refuge population had a very good production year in 1979. An estimated 350-400 birds produced 1,000 young with approximately 200 of these reaching maturity.

4. Other Animals

There was a large menhaden die-off and Pea Island's beaches were littered with the dead fish. State Fisheries and NMFS biologists could not determine the cause; however, the theory of death resulting from oxygen depletion of the water due to tight schooling to escape from predators was assumed.



Results of a menhaden die-off.

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

1. On-Refuge

The National Park Service held a bi-weekly tour of Pea Island for the summer tourist season. Staffing shortages

prevented refuge personnel from taking part in this tour; however, arrangements have been made to rectify this situation in 1980.

At their request five groups were given on-refuge programs. Approximately 2,500 public inquiries were handled on the station and six news stories were done on the refuge.



Wildlife observation on the refuge.

The N. C. Marine Resources Center staff conducted two tours on the refuge.

2. Off-Refuge

The refuge staff gave two off-refuge programs in 1979. One program was given to the Leopold Wildlife Club at N. C. State University in Raleigh, N. C. and a second program was given to the Wildlife Club at Mattamuskeet High School in Hyde County, N. C.

B. Recreation

1. Wildlife Oriented

The two major wildlife oriented activities on the refuge are wildlife observation and surf fishing. Wildlife observation is the most popular activity and a total of 442,323 hours were occupied in this activity. Surf fishing activity accounted for 384,160 hours. The availability and price of gasoline greatly affected the number of visitors to the refuge and their use patterns while here. The closure of the beach to vehicles in September of 1978 also had major impact.

A comparison of the two major activities for a four year period is as follows:

(Activity Hours)

<u>Year</u>	<u>Wildlife Observation</u>	<u>Surf Fishing</u>
1979	442,323	384,160
1978	553,000	458,500
1977	415,800	414,000
1976	298,100	348,000

2. Non-Wildlife Oriented

Since the beach closure to vehicles in 1978 this activity has primarily been restricted to swimming, picnicking, and other such as, sunbathing, surfing, watching the sunset, and "hanky-panky" in the dunes. The total activity hours involved in this category for 1979 was 139,386 which was a 22% decrease from 1978.

C. Enforcement

The law enforcement program is geared to actively protect the resources. Weekend and weekday patrols are conducted on the refuge and in the adjacent proclamation waters and locally, it is becoming well known that on Pea Island, violations are not taken lightly. The refuge staff also works closely with NPS rangers, the Dare County Sheriff's Dept., N. C. Wildlife Commission and the N. C. Highway Patrol.

All PFT staff members completed the Law Enforcement Training Academy in Glynco, Georgia in 1979.

The following is a breakdown of violations on Pea Island for CY 1979.

<u>Violation</u>	<u>Number of Incidents</u>
Parking in "No Parking Area"	71
Driving in closed area (driving on beach)	21
Driving off designated roadway (driving in dunes)	7
Illegal Camping	6
Possession of firearms/weapons	4
Hunting related	1
Dog off leash	1
Building fire in dunes	1
Illegal entry	1

As noted in the breakdown, the public invasion of the beaches by ORV's is the major environmentally damaging violation on Pea Island

VI. OTHER ITEMS

A. Field Investigations

The refuge did not undertake any field investigations in 1979.

B. Cooperative Programs

1. With the National Park Service acting as the lead agency, the refuge assisted in preparation of an environmental assessment on the proposed upgrading of Cape Hatteras Electric Membership Corporation's electrical supply capacity on the Outer Banks. Items reviewed were: wildlife impact of the lines themselves and the biologic and social impacts of the commercial development on Hatteras Island.
2. Pea Island and other FWS support agencies took the biological initiative in commenting on the environmental impact statement for the proposed construction of two massive seaward jetties for the Corps of Engineers stabilization of Oregon Inlet as part of the Shallowbag Bay seafood industrial complex project. The NPS provided the recreational and geologic data completion and the two agencies combined to express serious doubts about the project. If the jetties are constructed, the loss of Pea Island could result within ten years with serious erosional damage to other adjacent barrier island areas and estuarine bottoms.
3. Support was given to Dr. T. L. Quay of N. C. State University on a study of the succession of vegetative cover types on Pea Island and Bodie Island 1958-1978. Ground truthing of aerial photos was accomplished on Pea Island in December of 1979.

4. Dr. Mike Erwin of the Migratory Bird and Habitat Research Laboratory conducted an assessment of two census methods in heronries on the rookeries in North Pond in May and June of 1979.
5. Mr. Leo Snead, Jr. from Old Dominion University in Norfolk, Va. conducted a study entitled The Effects of Nutrient Concentration on Segregation Between Two Species of Salicornia on the tidal flat areas of Pea Island.
6. All sea turtle nesting data for 1979 was supplied to the Sea Turtle Recovery Team, NPS, and the State of North Carolina.

C. Items of Interest

After serving at Pea Island for ten years, Johnny Williamson transferred to Columbia, South Carolina to work in the FWS Animal Damage Control office there.

In November, the new manager, Ron Hight came on board. He was previously stationed at Nisqually Refuge in Washington.

The assistant manager position was filled in May. Mike Elkins transferred in from Blackbeard Island Refuge in Georgia.

D. Safety

Pea Island completed its 21st year without a lost time accident. Monthly safety meetings were held and pertinent films were shown and discussed.

The refuge safety plan was updated and emergency procedures regularly rehearsed.

E. Credits

This report was written by Assistant Manager, Mike Elkins and typed and assembled by Clerk-Typist, Beverly Midgett.

Date: June 27, 1980

Date: July 3, 1980

Approval: Albert R. Hight
Refuge Manager

Approval: [Signature]
Asheville Area Office