

# memorandum

DATE:

November 25, 1981

REPLY TO  
ATTN OF:

**Acting**

Area Manager, FWS, Asheville, NC

SUBJECT:

Late Submission of the Pea Island NWR Annual Narrative Report

TO:

Regional Director, FWS, Atlanta, GA (ARW)

This memorandum is meant to be a reminder that we agreed to permit Refuge Manager Hight to submit his 1980 Annual Narrative Report late because of his primary commitment to complete the Pea Island NWR Master Plan. Mr. Hight is to be commended for his fine Annual Narrative Report.

**/s/ Carrell L. Ryan**

cc:

Refuge Manager, Pea Island NWR

NOTE: This memorandum is to be inserted in the final copies of the Pea Island 1980 Narrative Report.

PEA ISLAND NATIONAL WILDLIFE REFUGE  
Rodanthe, North Carolina

ANNUAL NARRATIVE REPORT  
Calendar Year 1980

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

PERSONNEL

Albert R. Hight	Refuge Manager, GS-11 PFT
George M. Elkins	Assistant Refuge Manager, GS-7 PFT
Joseph B. Creef	Maintenance worker, WG 7 PFT
Beverly A. Midgett	Clerk-Typist, GS-3 PPT
	Secretary-Typing, GS-4 (12/14/80)
James D. Browning	Assistant Refuge Manager, GS-9 PFT (EOD 12/29/80)
Bonnie G. Woodall	Outdoor Recreation Planner, GS-7 PFT (EOD 12/29/80)

YACC ENROLLEES

Claudia Jones	January 1 thru August 29
Thomas Whitaker	January 1 thru May 20
Glenn Alexander	March 11 thru April 24
Karen Baker	March 11 thru December 31

REVIEW AND APPROVALS

Albert R. Hight 12/29/80 Pea Island NWR 12/29/80  
Submitted by Date Area Office Date

Pea Island NWR 12/29/80  
Refuge Regional Office Date

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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 12.5 miles from Oregon Inlet southward to the village of Rodanthe. An additional 25,700 acres of adjacent lands and waters in Pamlico Sound are closed by Presidential Proclamation to waterfowl hunting.

In 1937 a Congressional Act was passed establishing Cape Hatteras National Seashore. This Act recognized Pea Island Refuge as part of the Seashore but left administration of the Refuge in the hands of the U. S. Fish and Wildlife Service. The remainder of the Seashore was to be administered by the National Park Service. There is a cooperative agreement between the U. S. Fish and Wildlife Service and the National Park Service for management of recreational activities on the refuge and wildlife management technical assistance on the Seashore.

### B. Climate and Habitat Conditions

The weather conditions for 1980 deviated from the normal in several ways. A harsh winter storm arrived on March 2, resulting in 48 mph winds, 22 degree temperature, over ten inches of snow, and a power outage for 2½ days. The impoundments and most of the Sound froze over making it a stressful situation for all involved, human and animal.

Total precipitation for the year was 52.10 inches which was 2.95 inches less than the average. From April through August only 16.9 inches of rain fell. This was 6.4 inches less than average. This factor allowed us to drawdown the impoundments to complete needed repairs to water control structures and build nesting islands as part of the BIHP project. These dry conditions through the spring and summer resulted in poor production of aquatic vegetation in the impoundments.

Beach erosion continued at an average annual rate of 13 feet. Although there was no serious breaching of the dunes, ocean water did flow through the dunes and on to Highway 12 on several occasions during the year.

C. Land Acquisition

1. Fee Title

It was noted by a review of our files that there are several small islands on the sound side of the refuge within the Proclamation Boundary that are not owned by the FWS. The largest of these islands is Cat Island, approximately one-half acre. No impending development on these islands is expected at this time.

*Should be included in project completion phase*

2. Easements

N/A

3. Other

N/A

D. Systems Status

1. Objectives

The initial purpose of the refuge was to provide wintering habitat for the greater snow goose and other waterfowl species. In 1980 habitat manipulation for wintering waterfowl included planting green browse; water level management in the three impoundments; and mechanical brush clearing. In addition, BLHP funds were expended to prevent further erosion of the impoundment dikes and improve the water management capabilities.

Another wildlife objective includes providing habitat and protection for endangered and threatened species. Protection and habitat are provided for peregrine falcons, brown pelicans, southern bald eagles, and loggerhead sea turtles. Sea turtle management involves intensive nesting surveys and relocation of nests to a safe nursery area.

Another wildlife objective includes providing habitat for natural wildlife diversity. Several habitat types such as low salt marsh, dunes, and beach are not altered by management. All natural barrier island habitats are represented and protected on the refuge. Several potential threats to these habitats came closer to reality this year. The Corps of Engineers continued to propose stabilizing Oregon Inlet through the use of 10,000 foot jetties. This action could seriously curtail littoral movement of sand along the Outer Banks. The Cape Hatteras Electrical Co-op continued to propose upgrading of the existing power line through the refuge from 39.5 Kv to 115 Kv. There could be additional bird

strikes associated with this action. The N. C. Highway Commission continued to propose upgrading of Highway 12 through the refuge. Due to beach erosion, they may request relocation of the highway into certain wetland sections of the refuge.

The public use objective in general is to provide opportunities for environmental education, interpretation, and wildlife oriented recreation for over 1 million visitors. 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.

## 2. Funding

The refuge budget increased for fiscal year 1980 by \$26,100. Most of this increase was reflected in Migratory Birds (1210). This additional funding allowed us to keep up with inflation this year. It also made it possible to maintain equipment purchased in previous years through the BLHP program, and to initiate cyclical repairs to all buildings.

Major policy changes in construction on barrier islands altered the proposal for expending large sums of money on rebulkheading and replacement of water control structures in the refuge impoundments. The alternative to the original proposal included a small force account project to create islands in the impoundments and rehabilitate the water control structures.

A breakdown of funding history is as follows:

	<u>1210 Migratory Birds</u>	<u>1240 I&amp;R</u>	<u>1400 Endangered Species</u>	<u>FY Total</u>
FY-80	100,000 (60,000)*	19,000	1,100	120,100 (60,000)
FY-79	77,000 (367,400)**	16,000	1,000	94,000 (367,400)
FY-78	70,000 (31,500)	16,000	1,000	87,000 (31,500)
	27,800			27,800
FY-77	52,500 (33,400)	10,000 (2,000)	1,000	67,799*** (35,400)
FY-76	115,400****	9,900	1,000	126,300

\* - BLHP - Force Account Job Order to improve water management in impoundments.

\*\* - BLHP - Contract to replace bulkhead in New Field.  
Contract not awarded.

\*\*\* - Includes \$4,200 sale of equipment.

\*\*\*\* - Includes transition quarter and 52,000 rehab  
monies.

( ) - BLHP funding.

## II. CONSTRUCTION AND MAINTENANCE

### A. Construction

A small contract was let to Weiss Brothers Construction Co. to complete repairs and improvements to the office and residence. The work included new thermapane windows in both buildings, converting a service bay into office space, and carpet in the office. The contractor did a good job with the project but left the state owing the local building suppliers for materials.

The force account BLHP project occupied much of the summer. In this project we drewdown North Pond and New Field to enable the use of heavy equipment within each area. There were five islands built in North Pond and six islands built in New Field. These islands will deflect wave action which has caused erosion of the dikes. Two of the four tide gates in New Field were removed and rehabilitated.

The maintenance road into South Pond was rehabilitated through the use of a dump truck from Mattamuskeet NWR.

An ATC-110 Honda 3-wheeler was purchased to be used on beach surveys and operations. It has proven to be an effective tool in operating on a narrow, eroding beach plus the energy savings is significant.

### B. Maintenance

Locating and posting the Proclamation Boundary in Pamlico Sound was a major maintenance project. The project was to be part of an in-kind-service agreement with the Corps of Engineers. Through the use of the Corps sophisticated equipment, the actual water boundary was located and marked with floats. Unfortunately, commercial fishermen relocated the floats several times. In addition, the pile driving vessel could not reach but one section of the boundary line due to low water. The line was marked with 4x4's until more permanent piling can be pumped down.

C. Wildfires

No wildfires occurred on the refuge in 1980.

III. HABITAT MANAGEMENT

A. Croplands

The 50 acre New Field area was replanted with Kentucky 31 fescue and 16-8-8 fertilizer on October 15. Although this was a little late for planting fescue, the grass came on very well. The area received heavy use throughout the late fall and winter by Canada geese and to a lesser degree by snow geese. Two additional areas of approximately 2 1/2 acres each were planted opposite South Pond but were utilized only moderately by the geese. The two small areas will not be planted again.

*if we must continue to seed such yr which swans do to the east, they grass should be used.*

B. Grasslands

N/A

C. Wetlands

The refuge's wetlands consist of 3,024 acres of low marsh, 328 acres of salt flats, three managed impoundments totalling 950 acres, and one 9 acre natural fresh water pond. The impoundments include North Pond (461 acres), New Field (266 acres), and South Pond (223 acres).

The impoundments were drawdown in May to facilitate the BLHP rehabilitation project. Work on the project finally started July 14 after an extensive delay caused by the slowness of the Corps of Engineers in processing an amended permit application. With the assistance of Mattamuskeet's and Pungo's equipment and personnel, work proceeded rapidly. Construction of eleven long, narrow finger islands in the North Pond and New Field impoundments was completed in August. Seeding of the islands was accomplished in September and work on the 30 inch pump to be installed in North Pond began. Two of the flap gates in New Field had been removed and were being rebuilt by the end of the year.

The finger islands constructed in North Pond and New Field were to provide nesting and loafing sites for waterfowl and other birds and to control water erosion to existing bulkheads and dikes. Even though the vegetation present was scarce and spotty, the islands were used extensively as resting areas by geese, swans, and cormorants. Erosion to the dikes was also greatly reduced.

A good growth of wild millet, smartweed, and spikerush occurred in South Pond after its drawdown. It was the best emergent growth in any of the impoundments in many years. This attracted large numbers of shorebirds in the summer and waterfowl in the fall. After discussions with the East Coast Biologist, Otto Florschutz, it was decided to manage South Pond as a moist soil area for three years. It will be drawdown each spring and reflooded each winter. If the results are good, it will continue to be managed as a moist soil area.

No burning was undertaken in 1980. The fire management plan was written and submitted for approval in December.

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 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. 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

The threatened loggerhead utilizes Pea Island's beaches for nesting. In 1980, there were 12 nests found on the refuge. The first nest was recorded June 14 and the last nest July 30. Ten of the 12 nests were relocated to the refuge's protected nursery. The two nests left on the beach were lost to inundation from high tides. The ten nests in the nursery produced 538 hatchlings from 1,195 eggs. All except 7 of the hatchlings were released along Pea Island's beaches. The other seven,

including one born blind, were donated to the North Carolina Marine Resources Center in Manteo to be used for educational purposes and later released. The blind hatchling would remain in the Center's aquarium.

The National Park Service contacted refuge personnel about 5 nests located in high public use areas on Cape Hatteras National Seashore. These nests were relocated to the refuge nursery. Of the 610 eggs within the nests, 488 hatched. The hatchlings were released along the refuge's beaches.

Refuge personnel assisted the National Marine Fisheries Service in their survey of marine turtle nesting. Staff members did ground truths along the beaches on the 6 days NMFS had aerial surveys.

Three sea turtles kept by Dr. Frank Schwartz (Institute of Marine Science, The University of North Carolina at Chapel Hill) for research purposes were released on the refuge's beaches. They were implanted with internal tags as an experimental tracking program.

The fall of 1980 seemed to be the season of dead sea turtles. Fifteen loggerheads washed ashore on and adjacent to the refuge on November 18. Two additional loggerheads washed ashore in December. The exact cause of death was not determined, but it is believed most died from drowning in trawl nets.

## 2. Brown Pelican

While rarely seen a few years ago, eastern brown pelicans are becoming a common sight on the refuge, especially in the summer and fall. Pelicans were sighted from May thru December with a peak of 250 birds on November 15. Total use days for the year totalled 13,200.

## 3. Peregrine Falcon

The peregrine falcon has long used the Outer Banks as a migratory corridor. In the past, the refuge has had as many as 400 moving through. A peak of 23 has been sighted in one day. However, this year was an exception. Only 190 peregrine use days were experienced. Our peak for the year was 8 falcons on November 15. Two of these chose to linger until mid-March of 1981.

In June the refuge received a proposal from Dr. Abraham Schwartz of the Peregrine Fund to establish a peregrine release site (hacking tower). A meeting was held in Raleigh, N. C. in October to discuss the proposal. Manager Hight attended. Strong opposition was voiced

by the N. C. Museum of Natural History and the Audubon Society due to the refuge being out of the historical nesting range of the peregrine. The proposal was cancelled after the meeting.

Two injured peregrines were picked up on the Outer Banks in September and transported to a Washington, N. C. veterinarian. One falcon had been shot and the other had unknown injuries. Both died later.

#### 4. Bald Eagle

The refuge was visited by an immature bald eagle in May. It stayed for two days and then moved on.

### B. Migratory Birds

#### 1. Waterfowl

Several waterfowl species utilize Pea Island. Birds present this year included whistling swans, Canada geese, snow geese, coots, and 19 species of ducks. The most unusual sightings were a group of European wigeon, and one Ross' goose.

##### a. Populations and Use Days

The peak waterfowl population occurred in January with 44,500 birds. This was a 31% decrease from 1979. The following is a breakdown of how the different groups fared.

##### 1. Canada Goose

The peak population of 5,800 birds occurred on January 7. This was a 3% increase from 1979.

##### 2. Snow Goose

Snow geese populations peaked at 7,900 birds on January 7. This was a 30% decrease from 1979.

##### 3. Whistling Swan

The whistling swan peak also decreased. The 2,900 bird peak was 19% lower, the record high 3,600 of 1979. The 2,900 bird peak was on January 28.

##### 4. Ducks

The total duck peak population was 24,400 birds occurring on January 7. This was a 40% decrease from 1979.

## 5. Coots

The peak coot population was 3,500, the same as in 1979. The peak occurred on January 7.

The differences between the 1980 peaks and the 1979 peaks are misleading. In 1979 the refuge experienced the largest waterfowl peaks in several years. Comparing 1980 peaks with the averages of the preceding five years shows only major changes in swan and snow goose peaks. The swan peak was 101% greater than average and the snow goose peak was 26% less than average. The following table provides a comparison of peak populations for a six year period.

<u>Year</u>	<u>Swan</u>	<u>Snow Geese</u>	<u>Canada Geese</u>	<u>Ducks</u>	<u>Coots</u>
1980	2,900	7,900	5,800	24,400	3,500
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	35,376	10,000

The total waterfowl use days for 1980 was 2,759,915. Even though peak populations were 31% less than 1979, use days were only 4% less. The main reason for this was that several thousand geese and some swans lingered on about a month longer in the spring of 1980 than in 1979.

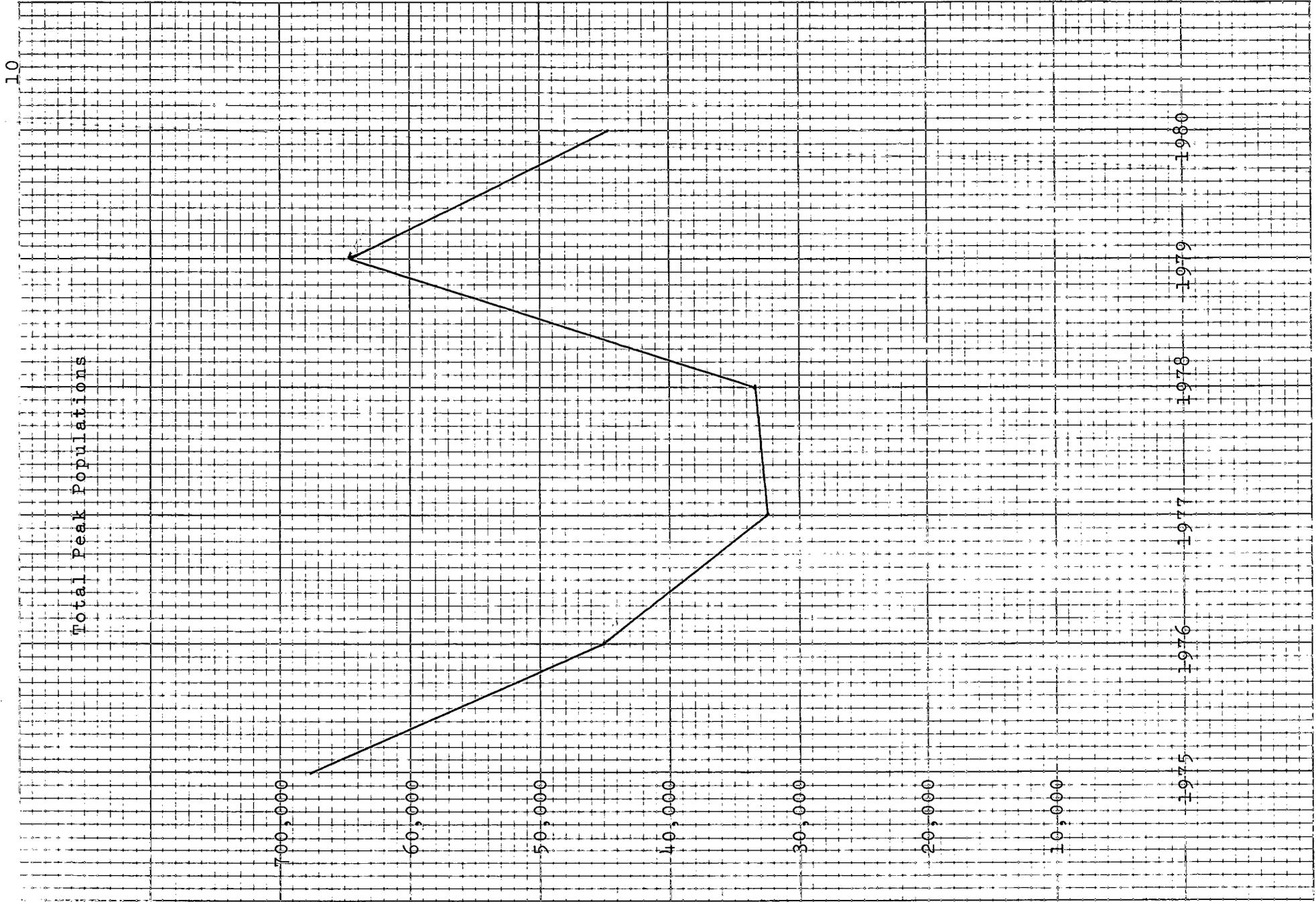
The following table provides a use day comparison for a 6 year period.

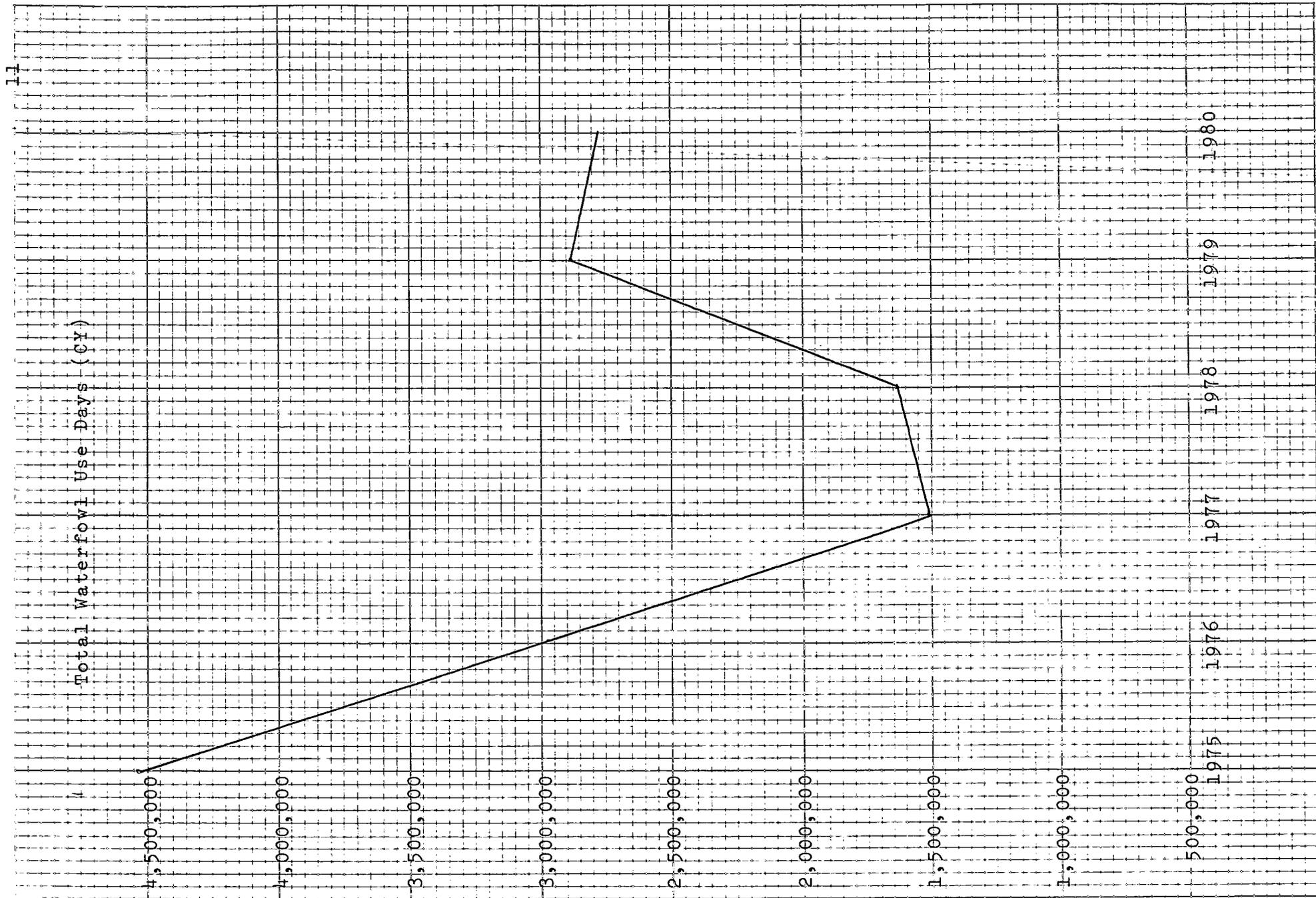
<u>Year</u>	<u>Swan</u>	<u>Snow Geese</u>	<u>Canada Geese</u>	<u>Ducks</u>	<u>Coots</u>
1980	150,456	444,050	295,515	1,771,105	98,789
1979	144,360	397,140	277,560	1,896,900	156,600
1978	23,580	335,010	83,940	1,101,300	88,110
1977	21,000	362,400	246,270	834,570	28,770
1976	48,930	491,640	270,990	1,676,820	544,440
1975	50,100	702,030	543,510	2,834,310	404,730

The six year comparisons are shown graphically for total waterfowl peak populations on graph 1, page 10, and total waterfowl use days on graph 2, page 11.

## b. Banding

The banding program met with limited success. The banding quotas were 200 black ducks and 50 mallards. The quota for black ducks was exceeded, but only 19





mallards were banded. There were very few mallards on the refuge this year. The following is a summary of banding results.

<u>Species</u>	<u>Number Banded</u>
Black Duck	210
Mallard	19
Mallard/Black Hybrid	3
Pintail	49
Wigeon	10
Redhead	3
Green-winged Teal	11
Hooded Merganser	1

Every fifth black duck was also banded with a \$25.00 reward band in cooperation with the North Carolina Wildlife Resources Commission.

In addition to the refuge banding program, the North Carolina Wildlife Resources Commission was granted a special use permit to band Canada geese. After banding 25 they abandoned the effort.

#### c. Waterfowl Production

Production normally consists of a small group of black ducks and gadwalls. However, this year broods of green-winged and blue-winged teal were also sighted. This is the first broods of blue-winged teal sighted since 1972. Total production was 885 birds, which consisted of 360 black ducks, 420 gadwalls, 80 green-winged teals, and 25 blue-winged teals. Production was 57% greater than the previous five year average.

#### 2. Marsh and Water Birds

The marshes and impoundments were heavily utilized by marsh and water birds for both feeding and nesting. Twenty-seven different species used the refuge for a total of 879,983 use days. This was a record high. A steady increase in use days has been noticed since 1975.

A table of comparison showing the last 6 years results is as follows.

<u>Year</u>	<u>Use Days</u>	<u>Peak Populations</u>
1980	879,983	8,836
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 only apparent reason for the steady increase is loss of habitat on lands adjacent to the refuge.

Three rookeries were found on the refuge this year. A total of 1,440 young were produced, a 300% increase over 1979. The following is a listing of nesting species and production:

White Ibis	75
Glossy Ibis	200
Common Egret	250
Snowy Egret	250
Louisiana Heron	175
Little Blue Heron	300
Black-crowned Night Heron	250
Yellow-crowned Night Heron	50

In more isolated locations in the marshes it is estimated that green herons raised about 30 chicks.

The most unusual sighting was a wood stork on October 15. It was seen only once.

### 3. Shorebirds, Gulls, Terns, and Allied Species

For many years Pea Island has been utilized by a number of different species. This year was no exception. (The peak populations totalled 75,200 birds). A total of 41 different species were sighted. Although most of these are yearly visitors, four rare visitors were observed. The four included two long-billed curlew, a ruff, and a purple sandpiper. This is the only known sighting of a purple sandpiper ever.

Total use days for 1980 totalled 6,407,810. This was a 5% increase from 1979. The increase was due to the drawdown of the impoundments attracting large numbers of dunlin, semi-palmated sandpipers, yellowlegs, and dowitchers. Also the closure of the beach to ORV use in 1978 has enhanced its use by shorebirds.

One colony of approximately 35 pair of least terns was located on the beach. The colony was active for approximately 1½ months and produced an estimated 60

young. Three pair of black skimmers and two pair of American oystercatchers also nested in the area. They produced 8 young oystercatchers and 6 skimmers.

In more isolated areas of the marsh an estimated 200 willet chicks were produced.

Adjacent 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.

#### 4. Raptors

Twelve different species of raptors utilized the refuge for a total of 20,800 days. The two species most observed were marsh hawks and barn owls. Approximately 25 barn owls are present year-round and approximately 40 marsh hawks overwinter.

Red-tailed hawks, formerly rare visitors to the area, have increased in numbers. It is believed that this is an indication of a higher rodent population.

Ospreys were frequently seen feeding in the impoundments and along shore during the spring. In March, two of them began building a nest on an artificial nesting platform in North Pond. The nesting attempt was successful and produced two young.

#### 5. Other Migratory Birds

Mourning dove populations have increased over the last three years to peak at 350 this year. Savannah sparrows peaked at 500 birds, the same as in 1979.

Although no data are kept, it is apparent that the brushy areas, especially along the impoundment dikes, are a haven to migrating song birds. There are 115 different species of song birds that migrate through the area yearly.

### D. Mammals, Non-Migratory Birds and Others

#### 1. Game Mammals

The muskrat and nutria populations continued to do extremely well. A study completed in and around North Pond indicated we had 2,075 muskrats on approximately 600 acres. That's an average of 3½ muskrats per acre! Total refuge populations were approximately 5,000 muskrats and 650 nutria.

Serious damage occurred to the impoundment bulkheads and dike berms from the burrows of these critters. They have now started burrowing under State Highway 12 causing it to crumble. Cold weather killed a few nutria but at present, highway traffic is the only effective population reducer. Data compiled from road kills on Highway 12 showed 154 muskrats and 5 nutria were run over during the year. A more effective control method must be initiated to prevent further damage to the area. *Increased control?*

Cottontail rabbits were frequently seen and often killed on the highway. Estimated population was 1,000 rabbits.

The other *ottentail?* population seemed to remain healthy. There were plenty of signs, but actual animal sightings were rare. It is believed that 30 individuals are present.

## 2. Other Mammals

Feral cats continued to be a problem. No data was recorded, but indications were the population continued to grow. The cat trapping program continued. Live traps were used (Hav-a-hart) to ensure other animals were not harmed. The 20 cats trapped were removed from the refuge. *where to?*

## 3. Resident Birds

The ring-necked pheasants continued to do very well. The refuge had a very good production year. An estimated 350-400 birds produced 800 young with approximately 150 reaching maturity. The peak population was 600 adult birds. With this many birds present, it was hard to believe the area is in North Carolina.

## 4. Other Animals

The first sighting of a cottonmouth moccasin on the refuge was confirmed by maintenance worker Creef. Before the sighting, the refuge was thought to have only nonpoisonous snakes.

# V. INTERPRETATION AND RECREATION

## A. Information and Interpretation

### 1. On-Refuge

A total of 1,514 activity hours were spent with on-refuge environmental education activities. Groups mostly

included classes from UNC - Chapel Hill, UNC - Charlotte, University of Virginia, and local schools.

Due to a shortage of staff with both NPS and Pea Island, no weekly summer interpretive programs were held at Pea Island.

A total of 10,630 activity hours were spent in on-refuge interpretation. A majority of this time involved use of the trail around North Pond and the observation deck.

Approximately 625 public inquiries were handled on the station and six news releases were sent out to local media.

The N. C. Marine Resources Center staff continued to utilize the refuge for group bird watching activities.

## 2. Off-Refuge

Six off-refuge programs were given for local groups. Included in these were a program for the Outer Banks Audubon Society and participation in the Visitor Orientation Program for Dare County.

## B. Recreation

### 1. Wildlife Oriented

Wildlife oriented recreational activities continue to be dominated by wildlife observation and surf fishing. The activities occur seasonally and have a good deal of overlap. Because of the geographic locations of the activities, however, no obvious conflict has been observed. Surf fishing, of course, occurs on the beach, while a majority of bird watching occurs around the impoundments to the west of Highway 12. Approximately 465,937 activity hours\* were spent surf fishing on the refuge in 1980. Other consumptive recreation activities included clamming, oystering, crabbing, and shelling. These activities accounted for 155,313 activity hours.

Wildlife observation activities (both vehicular and foot) accounted for 437,801 activity hours. Approximately 800 activity hours were spent participating in wildlife photography.

A comparison of a five year period for consumptive and non-consumptive recreation follows:

*vis. ts  
would be  
more  
meaning-  
ful than  
A.H*

## (Activity Hours)

<u>Year</u>	<u>Consumptive</u> (includes fishing and other)	<u>Non-Consumptive</u> (includes wildlife observation and other)
1980	621,250*	438,601*
1979	415,150**	442,323
1978	458,500	553,000
1977	414,000	415,800
1976	348,000	298,100

\* - Figures from 1980 public use reports were adjusted at the time this report was written. Public use report figures were grossly inaccurate. Due to personnel changes, it is impossible to determine how the figures were compiled.

\*\* - Figure was inaccurately reported in 1979 report due to miscalculation and/or mislabeling.

## 2. Non-Wildlife Oriented

Primary non-wildlife activities are swimming, surfing, and sunbathing. Due to the refuge being encompassed by a National Seashore, these types of activities are and will continue to be tourist season activities. Due to the seasonality of these activities, no obvious, major conflict with wildlife oriented activities has been observed. During 1980, 629,886 activity hours were spent in non-wildlife oriented recreation on the refuge.

## C. Enforcement

The law enforcement program continues to be geared to protect the resources. Weekend and weekday patrols are conducted on the refuge and in the adjacent proclamation waters. The refuge staff also works closely with NPS rangers, the Dare County Sheriff's Department, N. C. Wildlife Resources Commission, and the N. C. Highway Patrol.

The summer increase in visitor load brought with it an increase in illegal camping, vehicles on beach, and dune driving, as usual. During August and September there was a series of car break-ins. Cooperative efforts on the part of refuge staff, NPS rangers, and the Dare County Sheriff's Department eventually slowed down these activities.

The following is a break down of violations on Pea Island for CY 1980:

<u>Violation</u>	<u>Numbers</u>
Driving In Closed Area	21
Camping Illegally	7
Driving Off Designated Roadway	1
Illegal Fires	4
Cutting Sea Oats	2
Driving IN Dunes	6
Entering Closed Area (Terns Nesting)	2
Possession of Firearms	1
No Duck Stamp	2
Possession Of Lead Shot In Steel Shot Zone	2

*No hunting or other activities in this area.*

VI. OTHER ITEMS

A. Field Investigations

Claudia Jones, YACC enrollee, conducted a preliminary survey on North Pond to determine an estimated population of muskrats. The survey results show approximately 2,075 muskrats in and around North Pond.

Data was compiled of road kills on Highway 12 for CY 1980. These observations were incidental to other refuge programs. A total of 309 individuals were recorded for the period. Of these, 154 were muskrats.

The total figure is estimated to represent only approximately 60% of the actual road kills on the refuge.

B. Cooperative Programs

1. Dr. Mike Erwin of the Migratory Bird and Habitat Research Laboratory conducted an assessment of 2 census methods in heronries on the rookeries in North and South Ponds and in spoil islands.
2. The Christmas Bird Count was conducted on December 30, 1980. A total of 127 species observed included a Ross' goose and a Hudsonian godwit.
3. All sea turtle nesting data for 1980 was supplied to the Sea Turtle Recovery Team and the State of North Carolina.
4. The Department of Agriculture set a series of gypsy moth traps along N. C. Highway 12 through the refuge and maintained a monitoring program on these traps.
5. Rod McClanahan, Biologist, and several other employees of the N. C. Wildlife Commission banded Canada geese on the refuge. Capture was by use of a cannon net. Twenty-five geese were banded.

6. Initial contacts and plans were made involving the "Cape Hatteras Beach Trail" which is proposed by the N. C. State Department of Natural Resources and Community Development as a part of the "Mountains to the Sea" Trail System.
7. Plans and negotiations concerning the Manteo (Shallow-bag) Bay Project (jetty project) continue. No major decisions or compromises were made during 1980.

C. Items of Interest

1. Clerk-typist Beverly Midgett was promoted to GS-4 Secretary-typing on December 14, 1980.
2. Mike Elkins, assistant manager, transferred to Cross Creeks NWR on December 29, 1980.
3. Assistant Manager Donny Browning transferred from D'Arbonne NWR to Pea Island on December 29, 1980.
4. Also on December 29, 1980 Outdoor Recreation Planner Bonnie Woodall transferred from Iroquois NWR to Pea Island. This new position brings the Pea Island permanent staff total to 4 PFT and 1 PPT.

D. Safety

Unusually strong rip tides occurred on August 15 and 16. The result was 6 drownings on the Outer Banks. Also, a 13 year old boy washed overboard in Oregon Inlet. His body washed up on the refuge beach on August 20.

Glenn Alexander, YACC enrollee, slipped while loading timber and his foot was run over by the front wheel of a John Deere tractor. The accident occurred on March 20, 1980. The injury was diagnosed as a bruised foot.

Pea Island completed its 22 years without a lost time accident. Monthly safety meetings were held and pertinent films were shown and discussed.

E. Credits

Sections were written as shown:

Sections I & II	Manager Ron Hight
Sections III & IV	Assistant Manager Donny Browning
Sections V & VI	Outdoor Recreation Planner Bonnie Woodall

The report was typed and assembled by Secretary Beverly Midgett.