CHINCOTEAGUE NATIONAL WILDLIFE REFUGE
Chincoteague, Virginia
CEDAR ISLAND DIVISION
WALLOPS ISLAND NWR

ANNUAL NARRATIVE REPORT

CALENDAR YEAR 1989

U.S. Department of the Interior
Fish and Wildlife Service

NATIONAL WILDLIFE REFUGE SYSTEM

WO

REVIEW AND APPROVALS

CHINCOTEAGUE NATIONAL WILDLIFE REFUGE

Chincoteague, Virginia

ANNUAL NARRATIVE REPORT

Calendar Year 1989

John D. Schroer — Refuge Manager

2-27-90 — Date

Thomas J. McAndrews — Refuge Supervisor Review

Date

Nancy C. Conn — Regional Office Approval
Acting AKD - RW

4/2/90 — Date

INTRODUCTION

The Chincoteague National Wildlife Refuge is located primarily in Accomack County, Virginia with approximately 418 acres in Worcester County, Maryland. Most of the 10,413 acre refuge is located on the southern end of Assateague Island, a 37-mile long mid-Atlantic coastal barrier island on the east side of the Delmarva Peninsula. Additional lands can be found on the north end of Chincoteague Island (546 acres) and on Morris Island (427 acres) which is located between Chincoteague and Assateague Islands.

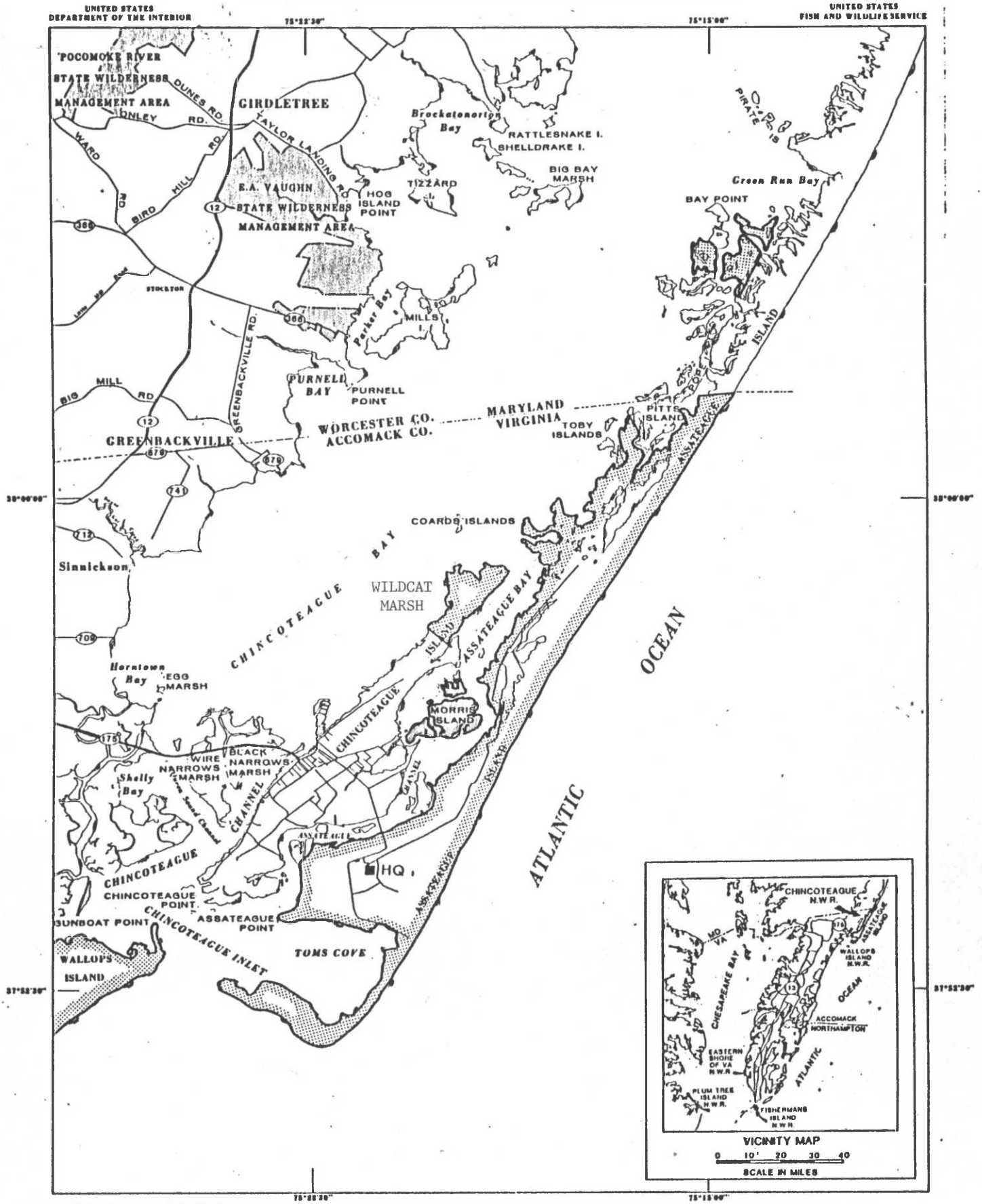
The refuge was established in 1943 under the authority of the Migratory Bird Conservation Act to provide migration and wintering habitat for migratory birds. Since 1943 refuge objectives have been expanded to include the preservation and enhancement of endangered species, the protection and enhancement of habitat for migratory and non-migratory species, and maintenance of a variety of habitat types conducive to the perpetuation and maintenance of indigenous species, and to provide opportunities for wildlife-oriented public use.

In 1965, after severe storms, Assateague Island was designated a National Seashore administered by the National Park Service (NPS) with provisions for the southern end to remain a wildlife refuge under the management of the Fish and Wildlife Service (FWS). The NPS acts as an agent of the FWS by administering recreational programs on that portion of the refuge beach known as Toms Cove Hook. The NPS authorities and programs are in accordance with provisions of a Memorandum of Understanding between the FWS and NPS.

The refuge receives almost 1.5 million visits annually and is well known for its abundant wildlife, sandy beaches and Chincoteague ponies.

CHINCOTEAGUE NATIONAL WILDLIFE REFUGE

WORCESTER COUNTY, MARYLAND AND ACCOMACK COUNTY, VIRGINIA



COMPILED IN THE DIVISION OF REALTY FROM U. S. G. S. MAPS

0 6000 12000 18000 24000 Feet

0 1 2 3 4 Kilometers

MEAN DECLINATION 1979

NEWTON CORNER, MASSACHUSETTS JUNE 1964

REVISED: NOVEMBER, 1985

INTRODUCTION

TABLE OF CONTENTS

Page

G. WILDLIFE

H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

Page

A. HIGHLIGHTS

Refuge acreage expanded to provide additional habitat for waterfowl (Section C.1.)

Drought of the 1980's ended as rainfall fell in excess during the year (Section B)

Change in the water level management program met with success (Section F.2.)

Piping plover production increased again (Section D.5.)

Refuge's appearance and interpretive programs improved with new signs and exhibits (Section H.1. and 4.)

Community and conservation group representatives met to discuss refuge issues (Section D.3.)

Waterfowl enforcement increased (Section H.17.)

Contract awarded to repair beach road (Section I.2.)

Concession contact point established in Visitor Contact Station (Section H.19.)

B. CLIMATIC CONDITIONS

Mother Nature was more than generous this year with moisture. Precipitation for the year, in contrast to the two previous dry years, was 41% above normal (24% below normal in 1988 and 19% below normal in 1987). Drought conditions that prevailed in late 1988 continued through most of January until significant precipitation finally arrived in late February and early March. The summer months are normally the wettest months and this year was no exception. The "monsoon" period of June, July, and August accounted for 42% of this years total precipitation. August alone had a record 13 inches; almost 9 inches above normal for that month. Above normal wet conditions continued though the fall with September, October, and November all recording above normal precipitation.

Temperatures and weather conditions varied widely throughout the year. The spring was unusually cold and wet. Typically hot, humid and muggy conditions prevailed during the long summer and early fall months. In December, an unusual three week long cold spell dipped the temperature to a record low of 4°F. Most refuge impoundments were frozen throughout the period and waterfowl were hard to find.

Winds were mostly normal for the year. Highest recorded wind speed was in March with 68 mph recorded during a

"northeaster". Hurricane "Hugo" posed a potential threat to the refuge on its way through the area, but luckily for the refuge, it went inland.

A summary of this year's monthly weather conditions appears below in Table 1.

Table 1: SUMMARY OF MONTHLY WEATHER CONDITIONS ON CHINCOTEAGUE NATIONAL WILDLIFE REFUGE, ASSATEAGUE ISLAND, VIRGINIA[1]

TABLE I

Month	Temp. (°F) Max.	Min.	Precip. (inches)	Depart From Normal (+/-)	Max. Wind (MPH)
Jan	64	18	1.51	-1.62	43
Feb	73	12	3.70	+0.48	41
Mar	84	25	6.55	+2.86	68
Apr	79	28	3.54	+0.77	54
May	88	39	2.85	-0.67	52
Jun	93	52	3.00	-0.62	49
Jul	97	57	8.25	+4.50	37
Aug	91	60	13.07	+8.76	35
Sep	92	43	6.21	+2.90	43
Oct	81	38	3.67	+0.32	39
Nov	72	20	3.70	+0.89	56
Dec	59	04	1.74	-1.57	48
		Totals	57.79	**+17.00**	

[1] Data compiled from information provided by National Aeronautical and Space Administration, Wallops Island, Virginia.

C. LAND ACQUISITION

1. Fee Title

During 1989 the refuge acquired the Guy Tract which encompasses 54 acres of marsh and upland adjacent to Wildcat Marsh. This acquisition makes a total of 546 acres being owned on the north end of Chincoteague Island. The marshes of this area are used by a variety of waterfowl including black ducks.

Morris Island, about 430 acres of salt marsh and upland, was also acquired during the year. The island is located between Chincoteague and Assateague Islands and serves as wintering and migration habitat for a variety of waterfowl including black ducks, mallards, greater snow geese, and brant. Negotiations for the purchase of Morris Island have been going on since 1985, when this land acquisition was approved. The Trust for Public Land was instrumental in the negotiations and purchase of both the Guy Tract and Morris Island.

Newly acquired Morris Island
NR-89-01 4/89 REW

3. Other

At the end of the year negotiations were in the final stages for the acquisition of Assawoman Island and 100 acres on the north end of Metompkin Island. These areas are typical barrier island habitat on which piping plover, Wilson's plover

and other shorebirds nest on the beaches while black ducks and other migratory birds utilize the adjacent salt marshes.

D. PLANNING

1. Master Plan

Although no formal work was done on the master plan, since the process was stopped in 1987, a considerable amount of discussion about the need for such a plan was conducted. Local community leaders were made aware that a master plan would help them answer many of their concerns about the future of this station. In addition, during a December meeting between Chincoteague community leaders and members of various environmental/conservation groups, they decided to send U.S. Fish and Wildlife Service Director Turner a letter requesting that Chincoteague Refuge be allowed to master plan. Hopefully, this process will begin in 1990.

2. Management Plans

A considerable amount of time was devoted to planning during the year. The Annual Water Management Program was submitted early in the year followed by a revised Predator Control Plan and the Annual Predator Control Program. In addition, the Hunting Plan was revised, and the Annual Hunting Program was formulated; however, both had to be amended prior to year's end due to the acquisition of Morris Island and commitments to allow waterfowl hunting on the island.

Although not completed by the end of the period, alot of effort went into the Public Use Plan, Pony Plan and Forest Habitat Management Plan. The Public Use and Pony Plans should be completed early in 1990.

3. Public Participation

During the year Manager Schroer met with local community leaders and members of environmental groups on numerous occasions. The fruits of these meetings were finally realized when representatives from the community and the environmental groups met together for the first time. The meeting was a success in that the various "opposing" groups found that some common ground does exist between the community and environmental/conservation organizations. Also as a result of the meeting, a joint letter was sent to Director Turner requesting that long range planning be reinitiated at the refuge.

4. Compliance With Environmental and Cultural Resource Mandates

Jerry Tracy, Corps of Engineers, made two site visits to the refuge this year to advise on permit requirements for the rehabilitation of the refuge boat dock and the placement of a water control structure in the Lighthouse Meadows impoundment.

The cultural resources survey conducted by R. Christopher Goodwin and Associates, Inc. was completed and the final report received.

5. Research and Investigations

Chincoteague NR 83 - "Relative Tolerance to Abiotic Environmental Stresses in Sympatric Estuarine Animals" (51570-83-03)

Dr. William A. Dunson, Professor of Biology at The Pennsylvania State University, University Park, Pennsylvania has been studying the tolerance of estuarine animals for several years on Assateague Island. Dr. Dunson's most recent research on the refuge is concerned with the study of salt marsh fish species and their tolerance to environmental stresses. Professor Dunson has recently written a manuscript entitled "Relative tolerances to abiotic environmental stresses of three sympatric cyprinodontid fish: Lucania parva, Fundulus heteroclitus and Fundulus luciae." Dr. Dunson's plans for the 1990 season will focus on the effect of very low salinities and changes in sodium, calcium and magnesium ratios on fecundity of Lucania parva. Dr. Dunson's studies are scheduled to continue through late 1991.

Chincoteague NR 86 - "The Vegetation of Assateague Island, Virginia" (51570-86-40908)

Dr. Richard Stalter, St. John's University, Jamaica, New York concluded this study in October. The refuge now has a herbarium full of identified and mounted plants covering all of the Virginia portion of Assateague Island (Chincoteague NWR). A total of 412 different plant specimens were identified and cataloged for the refuge. A botanical publication describing Dr. Stalter's study is scheduled in early 1990.

Chincoteague NR 88 - "Habitat Utilization and Social Behavior in an Insular Population of Delmarva Fox Squirrels (Sciurus niger cinereus) (51570-88-02)

Ms. Bonnie Larson, graduate student from the University of Virginia, began this study on the refuge's Delmarva Peninsula fox squirrel population. The objectives of this study were to: 1) investigate habitat utilization relative to fox squirrel population health and fitness on Chincoteague

National Wildlife Refuge, and 2) to investigate the importance of social behavior on population regulation. The major portion of this study concluded in May, with the radio tracking of squirrels continuing for a few more months.

A total of 69 squirrels were captured by live trapping or taken from nest boxes on the refuge. Age structure was strongly biased in favor of adults (45 adults:21 subadults:3 juveniles) and sex ratio in favor of males (43♂:26♀). Squirrels were much more abundant on one study area (Woodland Trail) than on the others. Only two lactating females and one litter of two young were observed. Females (949 grams) were heavier than males (895 grams) on the average.

The overstory on all study areas was dominated by loblolly pines, with occasional water oak, southern red oak and red maple. No squirrels were observed to move between study areas. Telemetry-estimated home ranges were small (1.4 to 12.8 ha) relative to previous reports (up to 30 ha). Most squirrel activity centered on nests and pine trees, with lesser percentages of time spent in hardwood trees and on the ground.

Food habits changed seasonally, with emphasis on acorns during the summer, green pine cones and the fruits of shrubs and vines during late summer/early fall, buds and later flowers during the winter, and mature pine cones from fall through spring. Fox squirrel abundance varied significantly among forest stands on the refuge. At least a portion of this variation results from inter-site variation in forest composition, forest structure and annual food resource availability.

Recommendations on managing the loblolly pine forest to benefit the squirrel included (1) the possibility of introducing more squirrels from outside the refuge and (2) creation of forest corridors between different areas to alleviate the serious genetic problems stemming from the tendency of fox squirrels on the refuge to remain within small areas.

Fox Squirrel Researchers w/telemetry equipment.
NR-89-02 4/89 REW

This collared fox squirrel met an untimely death.
NR-89-03 4/89 IWA

Chincoteague NR 89 - "Monitoring, Management, and Research of the Piping Plover at Chincoteague National Wildlife Refuge - Summer 1989. (51570-89-01)

In 1989, a Memorandum of Agreement between the U.S. Fish and Wildlife Service and the Virginia Department of Game and Inland Fisheries initiated the beginning of a three year management and research program of piping plover breeding biology at Chincoteague National Wildlife Refuge, Assateague Island, Virginia. Broadly delineated, the objectives of this three year study were (1) to continue the management procedures and population monitoring efforts established in 1988, (2) to further define and quantify factors limiting piping plover breeding success, (3) and to provide the necessary information and protection for the recovery of the piping plover as a breeder on the Chincoteague Refuge. This year's productivity estimate of 1.13 young fledged per nesting pair represents an increase of 35% over 1988 and suggests that recovery goals can realistically be met.

Piping plovers were first spotted earlier on the refuge in 1989 (March 2) than recorded previously on the refuge and elsewhere in Virginia (March 8, Metompkin Island, 1988). Courtship displays were observed on the Hook as early as March 16, earlier by two weeks than reported in 1987.

Nest searches resulted in the discovery of 32 nesting pairs and 36 nest attempts this year. Thirty nests (83%) were discovered while adults were incubating eggs, and six (17%) were accounted for by discovering a pair of adults with a brood of chicks. Twenty nests (56%) were discovered on the Hook, eight (22%) on the Wild Beach, and eight (22%) on the Wash Flats. The first two nests of the season were discovered on the Hook on April 25. Subsequently, nests were found on the Wash Flats on May 1, and on the Wild Beach on May 15. Twenty-nine piping plover nests (27 initial, 2 renests) were regularly monitored on the refuge this year. Although the total number of nests in this season (36) was similar to the total from 1988 (35), their distribution among nesting areas differed. Three more nests existed on the Hook this year, five more on the Wash Flats, and seven fewer on the Wild Beach.

Predator-proof exclosures were used on 100% of all nests attempts on the Hook where predation was thought to be the greatest. Exclosures were also used on 50% of all initial nest attempts and 100% of all renests on the Wild Beach and on the Wash Flats. Exclosures were constructed and placed as described in the Refuge's 1988 piping plover monitoring report. Predator-proof exclosures were constructed at 25 piping plover nests (Hook = 18, Wild Beach = 3, Wash Flats = 4). One exclosure on the Hook was removed one hour after its construction after no adult returned to incubate the eggs in that time period.

Adult piping plover
NR-89-04 4/89 RRC

Piping plover chick
NR-89-05 6/87 RRC

Adult piping plovers were captured for banding purposes at the nest during incubation only after a complete egg clutch was formed. Juvenile piping plovers were captured for banding purposes only after they had reached eight days or more of age. Twenty-two adult piping plovers were banded this year. This, combined with 15 nesting piping plovers observed with complete band compliments from previous years, means that 58% of the breeding adults in 1989 were of known identity. Seven breeding adults were observed with only partial band combinations. Twenty-six prefledged chicks were also banded from 15 different nests. Of these, 22 (85%) were known to survive to fledgling age.

A total of 36 piping plovers were observed on the refuge with complete band combinations (not including birds banded this season) allowing their individual identification by place of origin. Not all of these nested on the refuge this year. Some were migrants, and others may have been searching for mates or nesting territories.

Of 30 banded piping plovers breeding in 1988, 17 were accounted for in 1989 (including one breeding on Metompkin Island and one breeding on Wallops Island) resulting in a minimum survival rate of 57%.

One hundred twenty-seven eggs were produced in 36 piping plover nests on the refuge. Most eggs (59%) were found on the Hook. Twenty-five nests (69%) involved complete clutches. Egg production was highest on the Hook (3.75 eggs/nest) and lowest on the Wild Beach (3.13 eggs/nest), but lower overall than reported in 1988 (3.79 eggs/nest). Eighty-three percent of all nests hatched at least one egg, and 73% of all eggs hatched. Hatching rates per nest and percent hatching success were variable among nesting areas. with the Wild Beach showing the greatest hatching success (2.88 hatched/nest, 92% hatching success).

Of 93 chicks hatched on the refuge, 36 (39%) survived to fledgling age. Fledgling productivity for the refuge improved by +35% over 1988 to 1.13 chicks fledged per nesting pair, mainly due to improved fledgling success on the Wild Beach (0.08, 1988; 0.57, 1989) and Wash Flats (0.00, 1988; 1.66, 1989). Fledgling productivity decreased on the Hook this year from 1.63 to 1.15 (-29%) chicks fledged per nest. Hatching rates were consistently higher in all nesting areas at exclosed nests.

Highest losses to productivity occurred after eggs had hatched, owing to protection of eggs afforded by predator exclosures. Of 127 eggs produced, 34 (27%) were lost to various causes before hatching. But, of 93 chicks hatched, 57 (61%) were lost to various causes during brood-rearing.

Raccoons and red foxes were the only predators actively controlled for the benefit of piping plover breeding success. Causes of egg loss varied among nesting areas. Predation (mostly avian) accounted for most egg losses (52%) on the Hook. Fish crows removed one full egg clutch and two partial egg clutches even though the nests were exclosed. Closing the gaps between monofilament lines on the top of the exclosures curtailed further egg loss to fish crows at exclosed nests. Predator-proof exclosures were undeniably effective in protecting eggs. Of 24 nests protected by exclosures 22 (96%) successfully hatched.

Management procedures other than public use limitations for the piping plover emphasized the protection of eggs and young through predator control and the use of predator-proof exclosures. The combined efforts of mammalian predator control and exclosure of nests were successful in allowing most piping plover eggs (73%) to hatch undisturbed. But, excessive chick losses (61%) indicate that predator controls will need to be improved or intensified.

Management procedures should not be entirely relegated to predator control. Although predation (by various predators) was the leading cause of egg loss (41%) and the leading cause of chick loss (39%), inclement weather conditions (mostly flooding) caused the second highest egg loss (35%) and chick loss (26%). This project is scheduled to continue through the summer of 1991.

Chincoteague NR 88 - "Storm-related Mortality of Busycon spp. at Assateague Island National Seashore and Chincoteague National Wildlife Refuge" (51570-88-40923).

Dr. Terry Bashore, University of Maryland Eastern Shore, Princess Anne, Maryland initiated this project, funded by the National Park Service, of a storm-related mortality of the welk species Busycon carica and B. canaliculatum. Data collection is scheduled to occur on Assateague Island within the National Seashore and Wildlife Refuge. Expected completion date is mid-March 1990.

Chincoteague NR 89 - "Genetic Relationships and Biogeography of Small Mammals on the Southern Delmarva Peninsula" (5157-89-40953).

Dr. Raymond Dueser, University of Virginia, Charlottesville, Virginia initiated this study in early fall to 1) examine genetic relatedness among populations of rodent species on the Virginia barrier islands and 2) to compare patterns and degrees of genetic diversity within and among insular rodent populations. The primary objective of the study will be to measure the degree of geographical isolation of the individual islands and the ability of different species to colonize them. This study will continue through December 1990.

Chincoteague NR 89 - "Relative Abundances and Genetic Variation in Amphibians and Reptiles of the Virginia Barrier Islands: A Preliminary Assessment. (51570-89-40946).

Dr. Terry Schwaner, Virginia Museum of Natural History, Martinsville, Virginia began this study to (1) assess numbers of individuals as a guide to determining which taxa are best suited to future ecological, biogeographical and evolutionary studies and (2) accumulate samples of viable tissues for studies of genetic structure and phylogeographic relationships in island and mainland populations. The primary purpose of this study is to conduct a preliminary survey of the refuge (in conjunction with sampling on the mainland and other islands) to determine the feasibility of pursuing a more extensive analysis. The preliminary survey will continue through September 1990.

E. ADMINISTRATION

1. Personnel

As typical, numerous personnel actions occurred during the year. The year began with only one permanent full-time position being vacant; Oscar Reed filled that biological technician position as a temporary employee in February and was converted to a permanent employee in November. Two other permanent full-time positions became vacant during the period. Assistant Manager Nancy Phelps resigned in February to pursue a nursing career; her replacement, Debbie Melvin, transferred from Parker River Refuge in May. In addition, Secretary Judy Powers elected to transfer with a promotion to the Navy in April; Karen Mason, hired originally as a fee collector, began filling that position immediately and was converted to a temporary full-time secretary in June. Based on the complexity of work accomplished, Secretary Susan Merritt was converted to an office assistant which carried a promotion to a GS-6. In April, a temporary intermittent laborer, Ken Golway, was hired to work weekends and holidays to perform such tasks as litter pickup and janitorial duties during periods of high visitation.

J.L. Steele, returning to work in April, was the only temporary law enforcement officer who returned from 1988. Two new officers, Ken Dulik and Jeff Cravens, were recruited and began work in April and May, respectively. All three of these officers worked as temporary full-time employees until they departed; Jeff in September and the others at the end of December.

In 1989, the refuge got back into the coop student program as Tammy Tisdale from the University of Wyoming reported for duty in June. She departed in August to return to school.

Park Rangers, serving as fee collectors, returning from 1988 included Timothy Brooks, Brian Engelhart, Betty Jones, Bertie McNally, Kimberly Mills, Toni Reed, Eva Sherbert and Amy Winther. New fee collectors hired and reported to work in May included Bonnie Merritt and Sally Oshaben. Fee collectors were appointed as either full-time temporaries or intermittent employees, and five of them resigned for various reasons following the heavy public use season.

The following is a list of approved positions and the individuals occupying those positions during 1989:

Refuge Manager, GM-485-14 - John D. Schroer
Refuge Manager, GS-485-12 - Robert E. Wilson
Refuge Manager, GS-485-7 - Nancy Phelps/Deborah Melvin
Refuge Manager Trainee, GS-485-4/5 or Biological Science Student, GS-499-4/5 - Tamara Lyn Tisdale
Wildlife Biologist, GS-486-11 - Irvin W. Ailes
Biological Technician, GS-404-5 - Oscar Reed, Jr.
Outdoor Recreation Planner, GS-023-11 - Thomas R. Edgerton
Outdoor Recreation Planner, GS-023-9 - James H. Kenyon
Outdoor Recreation Planner, GS-023-7 - Charles A. Petrocci
Recreation Assistant, GS-189-4 - Jill Van Scoyoc
Recreation Assistant, GS-189-4 - Ann Rosalie Moore
Office Assistant, GS-303-6 - Susan W. Merritt
Secretary, GS-318-4 - Karen L. Mason
Facility Manager, GS-1640-9 - R. Jack Bowden
Heavy Equipment Operator, WG-5716-8 - Grover E. Wilgus, Jr.
Maintenance Worker, WG-4749-7 - Noah S. Williams
Maintenance Worker, WG-4749-7 - Carlton W. Collins
Tractor Operator, WG-5705-6 - Jeffrey E. Marshall
Laborer, WG-3502-2 - Kenneth G. Golway
Refuge Law Enforcement Officer, GS-1802-6/7, Kenneth Kessler
Refuge Law Enforcement Officer, GS-1802-5 - J.L. Steele
Refuge Law Enforcement Officer, GS-1802-5 - Kenneth E. Dulik
Refuge Law Enforcement Officer, GS-1802-5 - Jeffrey B. Cravens
Lead Park Ranger, GS-0025-4 - William H. Engelhart
Park Ranger, GS-0025-3 - Betty W. Jones
Park Ranger, GS-0025-3 - Amy E. Winther
Park Ranger, GS-0025-3 - Toni L. Reed
Park Ranger, GS-0025-3 - Bonnie A. Merritt
Park Ranger, GS-0025-3 - Kimberly E. Mills
Park Ranger, GS-0025-3 - Brian W. Engelhart
Park Ranger, GS-0025-3 - Sally Oshaben
Park Ranger, GS-0025-3 - Timothy P. Brooks
Park Ranger, GS-0025-3 - Bertie M. McNally
Park Ranger, GS-0025-3 - Eva M. Sherbert

NR-89-06 12/89

Left to Right

Back Row:	Schroer, Edgerton, Wilson, Williams, Marshall, Collins, Reed
Middle Row:	Kessler, Merritt, Ailes, Melvin, Petrocci, Moore, Oshaben
Front Row:	Kenyon, Bowden, Mason, Van Scoyoc

J. L. Steele
NR-89-07

Jeff Cravens
NR-89-08

Tammy Tisdale
NR-89-09

Judy Powers
NR-89-10

Grover Wilgus
NR-89-11

Ken Golway
NR-89-12

Left to Right:
Engelhart (Brian), Brooks
McNally, Sherbert,
Engelhart (Bill),
Oshaben
NR-89-13

Left to Right:
Jones, Reed, Mills,
Merritt, Winther
NR-89-14

Bob Cross - Piping Plover Researcher
NR-89-15

Summer SCA's
Left to Right: Vesna Ranisavljevic
Lisa Jordan

4. Volunteer Program

During the 1989 calendar year a total of 40 volunteers (up from 25 last year) donated 2900 hours (three times that of last year's 955 hours) to the refuge. The majority of these hours were spent staffing the Visitor Center (approximately 1600 hours) by ten local residents of the Chincoteague area.

Volunteers also performed a wide array of biological tasks on the refuge. The following list describes some of those tasks:
- recording weekly water level and salinity readings
- constructing and erecting new wood duck boxes
- assisting with waterfowl and shorebird surveys
- recording newly planted water oak seedling survival rates
- assisting with nest box checks of the Delmarva fox squirrel
- participating with Sika and Whitetail night spotlight counts
- constructing a waterfowl wing board
- entering wildlife statistics into the computer
- graphing weekly water levels and percent coverage estimates
- upgrading the refuge's collection of wildlife slides

Public use related projects included:
- guiding bird walks
- conducting historical tours of the lighthouse
- staffing the visitor center and selling books for the Natural History Association
- developing a Take Pride in America display
- cataloging slides
- researching public use refuge files
- staffing exhibits at local area wildlife/waterfowl shows

A refuge beach clean-up was conducted on September 16. A total of 107 volunteers donated a total of 535 hours collecting, recording and filling over 400 bags of marine debris along the 17 miles of refuge beach. Over 9 1/2 tons, including 246 automobile tires, were removed from the beach. Working in teams of two, volunteers were assigned a 1/2 mile section of beach to record and bag all pieces of trash. The data collected from the clean-up were compiled and analyzed by the Center for Marine Conservation. The clean-up was in conjunction with a national clean-up campaign called Coastweeks 89'. In addition to the refuge, a number of local and federal agencies were involved in sponsoring and promoting the clean-up. These groups included Department of Commerce (NOAA), National Park Service, Audubon Naturalist Society and the Committee to Preserve Assateague Island. Biodegradable bags made from a cornstarch base were donated by a national corporation.

A Volunteer Appreciation Day was held on October 13. Assistant Refuge Manager Melvin, the station's volunteer coordinator, hosted 30 volunteers, staff and their families at her quarters on the refuge in order to show the refuge's appreciation of their effort and dedication. Volunteer

Volunteers Art Gilmer (left) and George Orner place a predator shield on newly erected wood duck box.
NR-89-17 11/89 DM

Volunteers (left to right) George Orner, Art Gilmer and Tom Ratliff load wood shavings for wood duck boxes.
NR-89-18 11/89 DM

Volunteers fill out data card during beach cleanup.
NR-89-19 9/89 CKK

Volunteers Mark Garland (left) and Matt Lott with a hefty load gathered during the September beach cleanup.
NR-89-20 9/89 REW

certificates, coffee mugs and Service volunteer pins were awarded to eight volunteers who have each donated over 250 hours to the refuge. Ten additional volunteers received appreciation certificates and coffee mugs.

Three Student Conservation Association (SCA) Resource Assistants were recruited during the year. One worked during the spring and the other two during the summer months. Each SCA was assigned a 12 week work schedule and worked 40 hours per week. SCAs are considered volunteers but receive a stipend and housing while assigned to the refuge. SCA's traditionally assist with the diverse public use program offered at Chincoteague. This year all three assisted with operating the visitor center and developing/conducting interpretive programs and guided walks. They also were involved in a variety of biological programs. This year's SCAs included Marcia Kessler, a returning SCA married to Refuge Officer Kessler, Lisa Jordan from Rhode Island and Vesna Ranisavljevic from Windsor, Canada. An attempt was also made to have a fall SCA; however, none could be found.

5. Funding

A funding comparison by subactivity for the past five fiscal years is as follows:

Subactivity	Fiscal Year				
	1985	1986	1987	1988	1989
1113 Recovery	28,025	33,800	5,000	12,000	5,000
1261 Operation	*442,000	*509,442	363,312	279,740	530,561
1262 Maintenance			258,364	407,977	342,500
6860 Refuge Op/Maint	5,000	5,000	5,000	5,000	5,000
8550 Forest Pest Mgmt	40,127	22,661	23,860	35,968	33,336
TOTAL	515,152	570,903	655,536	740,685	916,397

* In 1985 and 1986 Subactivities 1261 & 1262 were combined into one subactivity which was 1260.

As is true most years, a number of funding changes occurred during the year. A total of $80,633 was added to the original 1261 budget. These funds were used to cover $47,153 in moves, $3,480 for a coop student and a $30,000 bail out covering an increased law enforcement presence and over-runs in the vehicle and equipment maintenance accounts, which were grossly underfunded in the original budget. The 1262 account originally contained $200,000 to partially repair the beach road. These funds were cut entirely from the budget early in the year and later reinstated at $148,000; although the project was not completed in 1989, a contract was awarded for $119,000. ARMM projects funded in FY1989 included $21,900 for making facilities more handicapped accessible, $5,000 for rehab of boat dock, $148,000 for beach road repair, $6,100 for

vehicle and equipment maintenance, and $8,000 for work on Cedar Island. Resource problem funds covered protection of Cedar Island at $10,000 and providing for recreation assistants at $32,800. Fire equipment funded during the year included radio equipment totalling $14,000.

In addition to the budgeted amounts, funds were also expended in two cost recoverable accounts, the 4960 fee program and 8610 quarters account. During FY1989, $76,595 was obligated out of the 4960 account for the operation and support of the entrance fee program. In maintaining refuge quarters, $3,212 were expended.

6. Safety

During the year 12 safety meetings were conducted by various staff members. A variety of topics were covered, including a review of the safety management plan, vacation/travel safety, CPR review, Lyme disease, use of fire pumper, harmful effects of the sun, defensive driving, boating safety, hurricane safety, basic fire fighting requirements and safety, cold exposure, and how to help the injured employee.

Most employees were tested for Lyme disease. All but three came back negative. The three employees were treated by their physician with tetracycline; however, no symptoms were ever exhibited.

On February 24, the refuge was closed to vehicular traffic due to heavy snow, high winds, and icy road conditions.

Radon test canisters which had been placed in all inhabited buildings were collected on July 1 and sent to the lab for analysis. Analysis indicated radon levels were within tolerable ranges and no action was required.

On July 17-21, the refuge was scrutinized by six safety committee inspection teams which were taking part in the Regional Safety Workshop held at the NASA training facility. Deficiencies in facilities, equipment, trails, and roads were identified. As a result of the inspection, some equipment such as the 5-ton dump-stake truck and the International 706 tractor were identified as safety hazards and beyond repair. These pieces of equipment have been scheduled for replacement for years, but no funds have been made available.

On September 20 and 21, preparation was made for the possibility of Hurricane Hugo hitting the area. All vehicles and heavy equipment were fueled and moved to high ground. Generators were moved to Q-47 and 48 and plans were made for refuge closure, if needed. The hurricane moved inland from Charleston, SC and no damage was received here.

Fee collectors Eva Sherbert and Amy Winther completed a basic CPR course held on the refuge on September 30. In addition, the following employees received CPR refresher training: John Schroer, Oscar Reed, Jr., Deborah Melvin, Ken Dulik, J. L. Steele and Charles (Kenny) Kessler.

No serious accidents or injuries occurred this year to staff or visitors.

7. Technical Assistance

Each year the refuge biologist provides technical assistance to the National Aeronautics and Space Administration (NASA) on Wallops Island to help identify active and potential piping plover nesting areas. Recommendations were provided to NASA officials on closing specific sites to NASA and Navy personnel activity to protect and reduce disturbance to this beach nesting threatened species. NASA did accept the recommendation by closing these critical areas.

As part of the North American Waterfowl Management Plan, the Fish and Wildlife Service made a commitment to assist the Department of Defense in developing waterfowl/wetlands management plans on its military installations. To assist the Service and the Regional Office in their commitment, the refuge biologist was assigned to help in the development of a supplemental waterfowl/wetland management plan for the Naval Surface Warfare Center, Dahlgren, Virginia. Development of the plan was a cooperative effort between the refuge biologist, waterfowl biologist from the Virginia Department of Game and Inland Fisheries, and the Naval installation's resource management specialist. Projects proposed for the installation included expansion of the existing wood duck nest box program, restoration of an existing dam and rehabilitation of a deteriorated water control structure, and developing a waterfowl survey program for the base. The final draft was completed in December with the signing ceremony and implementation of the plan expected sometime in early 1990.

8. Other

North American Waterfowl Management Plan

The North American Waterfowl Management Plan -- an international agreement signed between the US and Canada in 1986 to protect, enhance, and restore wetland habitats across the continent -- presents a number of new opportunities and challenges for NWRs. The plan establishes conservation goals for wetland habitats in specific regions of the continent; sets objectives for restoring waterfowl populations, and provides a framework for accomplishing local, regional, and international goals.

In the United States, six key waterfowl breeding, migration, and wintering habitat regions, called Joint Ventures (JVs), have been established to implement the plan. In Region 5, The Lower Great Lakes/St. Lawrence Basin and the Atlantic Coast JVs, have coalitions of federal, state, and private partners working together to restore waterfowl populations.

The Chincoteague NWR lies within the Atlantic Coast JV and is playing an active role in achieving the objectives of the JV and NAWMP. Approximately 2,800 acres of fresh and brackish-water impoundments were created on the refuge for migrating birds. The refuge provides and manages habitat for waterfowl, especially black ducks, as part of a long-range effort, in compliance with the NAWMP, to reverse significant drops in their populations.

NAWMP Activity Highlights

* Participation in the Deborah and Ward Foundation Decoy shows with display, emphasizing NAWMP and Wetland Conservation. (See Sec. H.6)

* Provided technical assistance and helped develop a Waterfowl/Wetland Supplemental Management Plan for assigned DOD installation (See Sec. E.7)

* The refuge acquired additional wetlands to protect black duck habitat (See Sec. C.1)

Entrance Fee Program

In an effort to streamline the fee collection program this year, the operations manual was revised to reflect updated procedures covered in orientation and training sessions held for returning and new fee collectors. Fee collector staffing was also cut back with the help of new statistical data collected on the operation to facilitate more efficient staffing.

Eight new information signs for the fee program were designed and ordered from UNICOR in March. The signs were received and installed in May, providing a much more professional look for visitors entering the refuge. They replaced the old in-house produced signs and appeared to have helped lessen some of the visitor confusion and traffic congestion of previous years.

During the year, ten GS-3 Park Rangers and a GS-4 Lead Park Ranger were staffed to run the program. Fee collectors operated the fee booths, controlled access to the oversand vehicle area and assisted as needed in the visitor center when various entrance fee passes were issued.

Performance standards and position descriptions were revised for all fee collector staff to more accurately reflect job responsibilities and expectations.

Fee collection began on March 17 and continued through the end of the year according to the following schedule:

DATES	DAYS	HOURS
03/17 - 04/01	Friday - Sunday	8:00 AM - 6:00 PM
04/02 - 05/02	Friday - Sunday	8:00 AM - 8:00 PM
05/03 - 05/26	Daily	8:00 AM - 8:00 PM
05/27 - 09/09	Daily	6:00 AM - 9:00 PM
09/10 - 10/28	Daily	8:00 AM - 6:00 PM
10/29 - 11/26	Daily	8:00 AM - 4:00 PM
11/27 - 12/31	Saturday - Sunday	8:00 AM - 4:00 PM

Visitors entering the refuge were required to pay one of the fees or present one of the passes outlined below:

TYPE	COST
ENTRANCE FEE - Vehicle and passengers (Valid for 7 days)	$3.00
ENTRANCE FEE - Moped (Valid for 7 days)	$1.00
ENTRANCE FEE - Commercial Bus with 20 or more passengers	$25.00
ENTRANCE FEE - Commercial Bus with less than 20 passengers	$15.00
FEDERAL DUCK STAMP	$12.50
GOLDEN EAGLE PASSPORT	$25.00
GOLDEN AGE PASSPORT	Free to U.S. Citizens 62 Years of Age and Older
GOLDEN ACCESS PASSES	Free to Disabled U.S. Citizens
SPECIAL PASSES - Issued to school science groups & official visitors	Fee Waived

In addition, $30.00 annual permit fees were collected from 4-wheel drive vehicle owners planning to enter the oversand vehicle area. Fees were not collected from hikers and bikers due to safety concerns and the fact that rough data from daily observations and an informal survey from a local bike rental business indicated that it would probably not be cost effective to do so; further review will take place in 1990.

Fee collectors were responsible for funds accountability and daily record keeping under the same system used in 1988. To help ensure consistency, periodic audits of fee booth operations and financial reports were conducted by the Lead Park Ranger. As in past years, the Marine Bank of

Chincoteague continued to hold and secure program funds. Each Monday a check for the amount above $5,000 was sent to the FWS Finance Center in Denver, CO. Although the bank retained $5,000 (per agreement) at all times while the program operated, it also charged regular deposit fees that, unfortunately, totalled more than $400 by the end of the year. A new arrangement will be sought in 1990.

From March 15 through August 31, when Toms Cove Hook was closed for the nesting Piping Plover, fee collectors regularly distributed a fact sheet to visitors about the refuge's plover management program. They also operated the oversand vehicle booth to issue vehicle permits, monitor visitor compliance with closure regulations and control the number of vehicles using the area at any one time.

What follows is a summary of the passes/permits sold and revenue collected through the 1989 fee collection program.

	Number Sold	Revenue
Vehicles	82,346	$247,038.00
Mopeds	408	408.00
Commercial Busses	53	1,205.00
Federal Duck Stamps	5,740	70,515.00
Golden Eagle Passports	349	8,725.00
Oversand Vehicle Permits	1330	39,900.00
TOTAL:		$367,791.00

The refuge received $89,182.80 which represents 30% of the total amount collected less Duck Stamp revenues. The program's operational costs for the year totalled $79,232.18.

F. HABITAT MANAGEMENT

1. General

Habitat types on the refuge fall into two main categories, wetland and upland. Wetlands are the dominant habitat type covering over 70 percent of the refuge. The wetlands are further broken down into three systems: marine, estuarine and palustrine. The marine habitat consisting of approximately 340 acres is found in the intertidal zone. The estaurine area is composed of over 3,700 acres of tidal wetlands located west of Assateague Island, on the north end of Chincoteague Island, and most of Morris Island. Nearly 3,000 acres of wetlands on the refuge are classified as a palustrine system, being mainly the freshwater impoundments and areas where freshwater is trapped in low areas of the barrier island. Besides protection, most active refuge habitat management in 1989 took place in the twelve freshwater impoundments which cover approximately 2,623 acres.

Upland habitat types found on the refuge can be broken down into forest, shrub, and beach/dune communities. Most of the over 1700 acres of forest are composed of almost pure stands of loblolly pine; however, mixed loblolly pine and hardwood stands, containing red, white and water oaks as the most abundant hardwoods, can also be found. Future management plans will call for managing the woodland upland habitat for the endangered Delmarva Peninsula fox squirrel. Shrub land covers about 450 acres and are comprised of such species as black cherry, blackberry, greenbriar, wax myrtle, etc. Beach/dune communities extend 17 miles along the Atlantic coast with the most characteristic plant species being American beach grass, saltmeadow cordgrass, seaside goldenrod, dune sandbur, etc.

2. Wetlands

Due to drought conditions which plagued this area during the 1980s, a typical water level management program consisted of maintaining as much water as possible in the spring in most impoundments. Even with this practice, many impoundments went dry during the spring and summer resulting in very little growth of waterfowl foods. Not knowing what rainfall would come in 1989, the decision was made to change the water level management program to allow for a drawdown to about 50 percent water coverage in most impoundments by the middle of May, hoping to take advantage of early germination and growth of waterfowl plant foods when moisture was plentiful. In ten impoundments water levels were lowered beginning on May 1 and were at about 50 percent water coverage by May 15. The response of waterfowl plant foods was tremendous as good stands of American threesquare and dwarf spikerush were evident by the end of May. With both May and June experiencing below normal precipitation, the summer drought of previous years was expected, and water levels in impoundments dipped well below 50 percent coverage. However, the three months following June were blessed with over sixteen inches of rainfall above normal, resulting in a water management program which was dealing more with losing water than experiencing a drought. Reflooding of these impoundments began on September 1, and adequate rainfall came to have full pools for wintering waterfowl. The result of the earlier drawdown and adequate rainfall was a series of impoundments more than ready for the fall migration of waterfowl.

Two impoundments, North Wash Flats and F Pool, also benefit waterfowl as resting and feeding areas; however, their water levels are manipulated for other purposes. North Wash Flats impoundment is managed primarily for shorebirds and particularly the threatened piping plover, which nests on the bare exposed areas of that pool. In order to provide this nesting habitat, drawdown of this impoundment began in mid-March. By May this impoundment was down to approximately 30

percent water coverage making ideal conditions for the spring migration of shorebirds, as over 15,000 were counted in this area at that time. Unfortunately heavy rains, above the capacity of the water control structures, resulted in high water levels during the August and early September migration of shorebirds, which was reflected in the low numbers of shorebirds using the impoundment. Reflooding to full pool began on November 1 to provide for wintering waterfowl.

Water levels in F Pool were not directly manipulated during the year, as water levels were dictated by rainfall. This pool was maintained at a near full level most of the year which resulted in an excellent area for marsh and waterbirds, as well as waterfowl and shorebirds which used the fringe areas.

Vegetation transects were completed in ten of the refuge's impoundments in late September. Excellent stands of preferred waterfowl plants were found. The five most dominant species identified in all the impoundments included, in order of dominance, red top grass, American threesquare, dwarf spikerush, saltmeadow hay and widgeon grass. Plant species diversity and composition were measured using ocular estimates within random one-meter square plots located along transect lines. The five dominant species were recorded along with percent coverage estimates. Annual vegetation transects will continue to monitor species diversity, composition and stratification within the impoundments.

Assistant Refuge Manager Debbie Melvin and Biotech Oscar Reed run a vegetative transect in B-pool.
NR-89-21 10/89 IWA

3. Forests

As in 1988, the southern pine beetle (SPB) continued its presence within some of the mature loblolly pine forests. Aerial surveys conducted in March and again in July revealed three main areas that required close observation. In cooperation with the U.S. Forest Service's Pest Management Specialists, three pine beetle traps were established in and adjacent to these areas. Collection of beetles and clerids continued for four weeks, each having seven interval trapping days. All specimens were returned to the Pest Management Office in Asheville, NC, for analysis. According to the results, the SPB infestation is predicted to increase from last year's level. The refuge will continue to monitor the effects of the beetles.

In an effort to increase habitat for the endangered Delmarva Peninsula fox squirrel over 600 water oak seedlings were planted within the SPB clear cut areas. In April, a local area boy scout troop was recruited to plant the seedlings among native southern red oak and pine saplings. Wire mesh exclosures were then erected around the young seedlings to prevent browsing by deer and ponies. Refuge volunteers were later recruited to locate and record survival rates of the oak seedlings. After locating approximately 300 seedlings it was estimated that only approximately 20% of the young trees survived. The poor survival rate is probably attributed to an early dry spell, poor soil conditions and late planting.

4. Croplands

In past years, the refuge managed the small farm fields, an area totalling 32 acres for producing browse for Canada and snow geese. Poor soil conditions (sandy), high fuel and fertilizer costs and poor crop production terminated this management operation. Millet, rye and winter wheat were the main agricultural crops sowed in these areas. The majority of these farm fields have reverted back through natural selection to native plant species commonly found on barrier beach islands. In April, the entire 32 acres were mowed in an attempt to retard the intrusion of wax myrtle and other woody shrubs.

In 1989, the extensive borrow ditches associated with the farm fields were incorporated into the moist soil management program. Boards were placed in front of corrugated pipes connecting the ditches in an attempt to flood the surrounding area to increase use and availability to waterfowl. Although vegetation transects were not conducted along these areas, good stands of smartweed were noted.

B-Pool showing the positive results of moist soil management and early drawdown.
NR-89-22 9/89 IWA

Flooded 3-square stand in B-pool awaits fall migration.
NR-89-23 9/89 IWA

6. Other Habitats

Of the 10,000 plus acres that make up Chincoteague Refuge, roughly 1800 acres are classified as beach and dune habitat. Characteristic of barrier beach islands, these areas are unstable and are constantly subject to severe erosion and accretion. Ocean currents tend to erode northern beaches and shifting sands tend to drift southward toward the southern tip. Northeasters which occurred during the spring caused considerable dune erosion, particularly in the areas where dunes are artificially maintained.

In an effort to stabilize localized areas of the dunes, the National Park Service planted beach grass in designated sections of the high dune line. A group of 20 volunteers from the Committee to Preserve Assateague Island and Audubon Naturalist Society spent one weekend in April planting American beachgrass in the assigned area at the beach.

NE storms continue to erode dunes.
NR-89-24 2/89 REW

7. Grazing

Since 1946 the Chincoteague Volunteer Fire Company has been issued an annual Special Use Permit to graze up to 150 "Chincoteague ponies" on the refuge. Existing records suggest that the ponies were allowed to graze over the entire refuge until the late 1950's when two fenced compartments were established. Since then and 1989, the ponies were kept behind fences on an "off and on" basis. The ponies not used to

fences were intent on getting out to find "greener" pastures and keeping the fences tight was a problem due to the ponies themselves and natural factors, such as falling limbs and ice. To make a long story short, the ponies were probably out more than in during that period.

Due to the negative impact which grazing ponies may have on waterfowl food production in impoundments and the people-pony conflicts that exist when the two are mixed, the decision was made to once again fence the ponies. To prepare for this task, the Black Duck Marsh compartment was reduced in size to about 650 acres in order to exclude a public use hiking/bicycling trail. In addition, a fence was erected around most of the North Wash Flats to exclude a piping plover nesting area from the north compartment which has 3400 acres. The fences were made tight and following the pony swim in late July the ponies were distributed between the two compartments. Although not all, most ponies remained in place until a severe freeze-up damaged the fence releasing the captive animals. The refuge staff has vowed to win this never ending battle of pony containment or retire trying.

The annual Special Use Permit to the Chincoteague Volunteer Fire Company for grazing up to 150 ponies was strengthened and issued to cover FY1990. A condition was added to require an on-site licensed veterinarian to be present during the pony round-up and penning operation with specific duties which must be performed before the round-up will be allowed. In 1989, a condition existed requiring a licensed veterinarian to be present which did not happen resulting in an outcry from the Humane Society of the United States. Other conditions call for the fire company to keep the ponies in the compartments and to assist with fence upkeep. The grazing fee was also increased from $180/year established in 1946 to $1,500/year.

9. Fire Management

Wildfires, although not frequent on this station, do occur as wildfires were extinguished on three occasions during the year. The first fires located in three different locations along the wildlife loop occurred on April 24. Refuge staff and members of the Chincoteague Volunteer Fire Department responded and contained the fires to less than one and one-half acres; due to fires in three locations, arson was suspected. Then on August 27, two fires along the drive were discovered and again extinguished by refuge and fire company personnel with the same thing happening again on September 1. Both of these fires burned less than one-half acre apiece. All fires were located in the loblolly pine forest with only the thick understory being burned. The refuge does have a fire suppression agreement with the Chincoteague Volunteer Fire Company calling for payment for services rendered; however, they chose not to charge the refuge for their fire suppression activities in 1989.

No prescribed burning was conducted on the refuge during 1989.

10. Pest Control

On August 31 the refuge was notified that one of the two horses that died during pony penning activities was diagnosed as having Eastern Equine Encephalitis (EEE). No autopsy was performed on the other horse, and although over exertion during the round-up was suspected, EEE was probably the cause. In addition, two confirmed cases of EEE were noted in ponies on the north end of Assateague island, an area controlled by the National Park Service. Up to nine or more ponies on the north end may have died as the result of EEE. This virus, carried primarily by wild birds and transmitted by mosquitoes, is very deadly to horses with 90 percent of those contracting the virus dying. EEE is also a deadly virus to humans. The presence of the virus, an over abundance of mosquitoes and large numbers of visitors expected over the Labor Day weekend led to the decision to spray for adult mosquitoes. After consultation with Center for Disease Control and regional office staff who obtained permission from the Chief of the Office of Environmental Project Review, Department of the Interior, an aerial application of Dibrom #14, an adulticide, was applied to 5,700 acres at a cost of $6,670.

No active management has been initiated to control phragmites since the aerial application of Rodeo on 180 acres in 1987. Close monitoring of the invasion of this pest species continued in 1989 and possible control methods will be considered for 1990, if funding permits.

G. WILDLIFE

1. Wildlife Diversity

Management programs on the refuge are not specifically designed to increase wildlife diversity. However, program activities associated with water management, pest control, and habitat manipulation will contribute to providing increased habitat diversity for a variety of different wildlife species.

2. Endangered and/or Threatened Species

The Delmarva Peninsula fox squirrel and the peregrine falcon are the two permanent resident endangered species found on the refuge. A third species, the bald eagle, is an occasional visitor to the area. Threatened species on the refuge include the piping plover and the Atlantic loggerhead sea turtle. The piping plover is a summer beach nesting bird, and the loggerhead turtle is frequently observed off shore and in the bays and very infrequently comes ashore to nest.

The present population of the Delmarva fox squirrel is limited to a few counties on the Eastern Shore of Maryland, a small introduced population on Assateague Island and on lands of The Nature Conservancy, both on the Eastern Shore of Virginia. Research on the refuge fox squirrel population over the past few years indicates that this population is self-sustaining with a population possibly as high as 300 animals.

Each year a squirrel nest box check is conducted to determine box utilization and reproduction success. On the evenings of the 18th and 19th of February, refuge staff and biologists conducting research on the refuge's squirrel population checked a total of 119 boxes. A total of 25 squirrels were found, with a box use of 27 percent overall, compared to 31 squirrels and 39 percent in 1988. The Woodland Trail area of the refuge continued to have the highest box use.

Resident peregrine falcons nested on the Wash Flats hacking/nesting tower for the eighth straight year. Production on the tower varies from year to year on the number of young they produce. This year, they were successful in raising three young birds. In the past eight years, the tower has been a successful home to a total of 27 young peregrines. Although successful for eight consecutive years, banding has shown that it has not been the same birds all those years. The assumption is made that when one of the pair is lost, the remaining bird chooses a new mate.

Peregrine falcon chicks in North Wash Flats nesting tower.
NR-89-25 6/89 IWA

The yearly autumn peregrine falcon banding research project was conducted for the 20th consecutive year on all of Assateague Island by Dr. Scott Ward and his associates of the U. S. Army. Dr. Ward and his crew were successful in capturing and banding 205 peregrines during the four week period; the second highest number banded during the annual four week project. This was also the 50th anniversary of peregrine falcon research on Assateague Island. In 1939, Al Nye banded the first peregrine falcon on Assateague Island.

The bald eagle is only an occasional visitor to the refuge. A pair have maintained a nest approximately five miles northwest of the refuge near the community of Sinnickson, Virginia. A second pair has recently established a nesting area near the town of Atlantic, Virginia, approximately five miles southwest of the refuge. Reports of eagles on the refuge were frequent this year, with most reports in early fall and late winter.

The Atlantic loggerhead sea turtle visits the refuge beaches as a nesting species very infrequently. This year, no nests were documented or reported; however, two dead turtles washed ashore that required attention. Measurements and other data were taken and forwarded to personnel at the Virginia Institute of Marine Science for their turtle stranding database.

The threatened piping plover is a summer visitor to the refuge that nests on the refuge beach. Efforts to provide protection to nesting plovers resulted in the refuge closing the Toms Cove Hook Beach for the plover breeding season to all public access for the second year. In cooperation with the Virginia Department of Game and Inland Fisheries, an intensive plover monitoring and research program was conducted this year to collect data on nesting and fledgling success on the refuge. Results of this year's program can be found in Section D5.

3. Waterfowl

The dry conditions which plagued waterfowl impoundments during the 1980's did not exist in 1989; a change in the water management program and adequate rainfall resulted in an abundance of available waterfowl foods in refuge impoundments. Despite these excellent conditions, the waterfowl did not respond as anticipated, as overall waterfowl populations declined over the past year. Refer to graphs on the following page for monthly plotting of population indexes for several species.

Significant decreases were noted in many species such as greater snow geese, black ducks, pintails and mallards. Increases occurred in such species as gadwalls, green-winged teal, Canada geese and tundra swans. Greater snow geese, for which the refuge was established and which peaked at 23,000 birds in the early 1980s, were present on the refuge but with

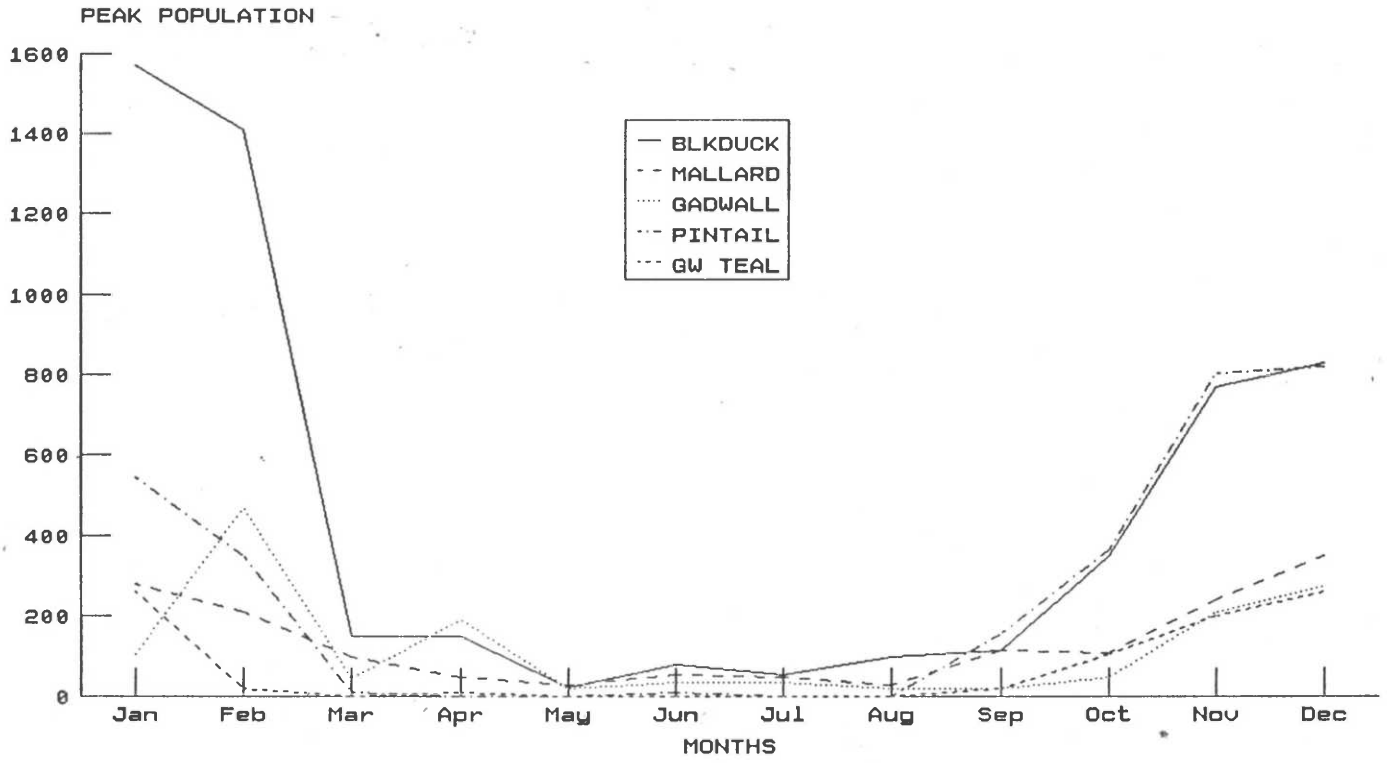
peaks of less than 2,000. This drastic decline is not indicative of how the greater snow goose population is doing. The feeding habits of these birds tend to be favoring winter grain fields on the adjacent mainland over their traditional feeding areas, the salt water marshes, since huge flocks of these birds could be found in these fields during the late fall and winter.

Overall waterfowl numbers using the refuge may have been influenced by two environmental factors during the period. When the year began, previous dry conditions resulted in very little water being present in the freshwater impoundments. As previously mentioned, this situation was rectified as above normal rainfall fell during the year. However, a very unusual cold spell hit this area in December at which time all impoundments became frozen with no open freshwater. Populations of all waterfowl dropped drastically because of this freeze-up.

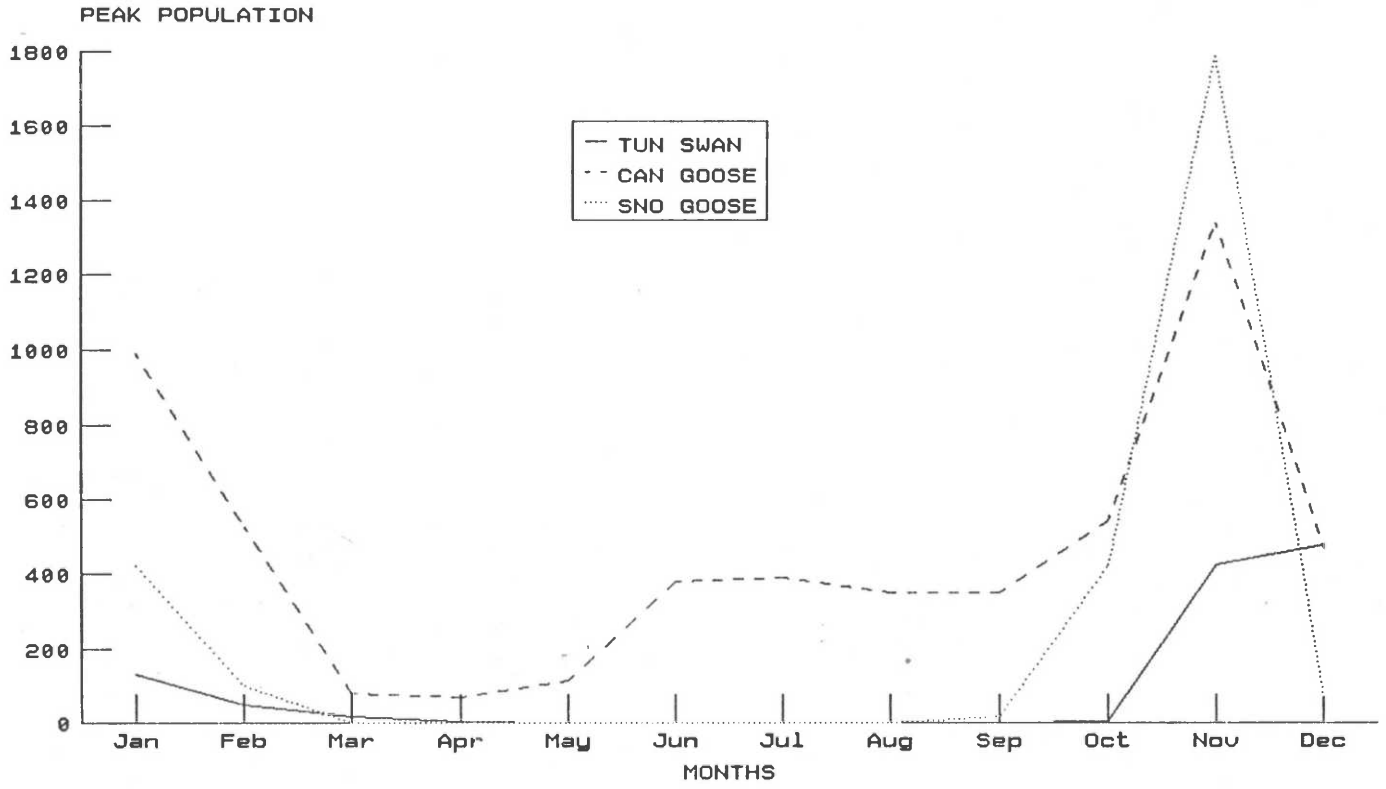
Snow geese in A-pool "enjoy" a December snow storm.
NR-89-26 12/89 DM

Waterfowl production also decreased over CY88. Production was down 28 percent over 1988 with an estimated 279 young produced. Canada geese were the most productive with an estimated 90 breeding pair producing 140 young. Mallards, black ducks and gadwalls produced around 30 to 35 each, with blue-winged teal and wood ducks producing 10 and 15, respectively. Wood duck population is expected to increase

WATERFOWL (DUCK) POPULATION INDEX
CALENDAR YEAR 1989



WATERFOWL (GOOSE & SWAN) POPULATION INDEX
CALENDAR YEAR 1989



next year since all of the deteriorated metal stovepipe nest boxes have been replaced with wooden ones. Mute swans also had production of 15 which can pose future management problems for the refuge.

4. Marsh and Water Birds

Fifteen species of birds in this group were observed on the refuge at one time or another during the year. Many species arrived in April and remained until late November. Most numerous were great and snowy egrets. Both species of pelicans were present again this spring. The browns usually occurred during the early summer, and two whites were present during most of the spring but disappearing on and off the refuge throughout the summer.

5. Shorebirds, Gulls, Terns and Allied Species

Forty-two species of this group of birds were recorded on the refuge. Many shorebirds and gull species started arriving in early April. Shorebirds were greatly benefitted by the earlier water drawdown which occurred in most impoundments as over 15,000 shorebirds were observed in the North Wash Flats impoundment in May. However, heavy rains in July and August resulted in full impoundments during the late summer migration of shorebirds at which time less than 50 could be found in the North Wash Flats. Species nesting on the refuge included the piping plover, willet, American oystercatcher and several tern species.

6. Raptors

Ten raptor species frequented the refuge at various times during the year. The majority occurred during the fall migration period in September and October. Most common species included the northern harrier, American kestrel, sharp-shinned and cooper's hawks, great-horned and eastern screech owls, red-tailed hawk, and the osprey. Bald eagles were sighted on several occasions this year. Osprey, great-horned and screech owls, and red-tailed hawk nested on the island.

7. Other Migratory Birds

Birds in this category were numerous. Most commonly encountered were many species of warblers, especially during the spring and fall migration. No population data were collected on this varied group of birds.

Snowy egrets are a common sight in and around the shoreline of refuge impoundments.
NR-89-27 Photo courtesy Michael Colopy

Forster's tern commonly greeted visitors as they crossed the bridge onto the refuge.
NR-89-28 Photo courtesy Michael Colopy

8. Game Mammals

The Virginia white-tailed deer and exotic sika (oriental elk) are the only big game species found on the refuge. Although good population data are not known, information from the sika hunting program indicates a very high population of sikas for the size of the refuge. The white-tailed population is considerably smaller with a ratio of 6:1 in favor of sikas being seen during night counts. Concern exists that sikas are out-competing the native species; therefore white-tailed hunting was discontinued three years ago. See Section H.8 for hunting information.

9. Marine Mammals

On December 20 a young humpback whale washed up on the southern portion of the refuge beach. The day before, this same whale became stranded in a shallow bay near Ocean City, Maryland where rescuers were able to lead the whale through deeper channels back out to the ocean. Researchers and mammologists from the National Aquarium in Baltimore, Virginia Institute of Marine Science, and the Smithsonian Institute were contacted and arrived at the refuge on December 21 to collect samples and data and possibly to determine the cause of death. The National Marine Fisheries Service coordinated the effort. The young whale, a female, was approximately 1 1/2 years old and measured 28 1/2 feet in length. Refuge staff, assisted by National Park Service staff, buried the whale since a university expressed an interest in retrieving the skeleton once decomposition has occurred.

10. Other Resident Wildlife

Species in this category included the bobwhite quail, cottontail rabbit, opossum, red fox, river otter, muskrat, and raccoon. No specific population data were kept on most of these animals; however, fox and raccoon populations were monitored through fox den survey and predator scent stations survey. Data from the annual scent station survey indicated that both fox and raccoon population indices have increased by 153 and 21 percent, respectively, despite an intensive predator control program this past year.

11. Fisheries Resources

No quantitative data were collected on this group of animals. Freshwater fish species found in the refuge impoundments include five species of killifish, two species of stickleback, white perch and the American eel. Fishing was permitted on the beach and in one impoundment, where white perch are taken in small numbers.

Manager Schroer being interviewed by local TV stations regarding beached whale.
NR-89-29 12/89 TRE

14. Scientific Collections

The refuge herbarium received 412 identified and mounted plant specimens as part of the agreement with Dr. Stalter, Professor of Botany, St. John's University at the conclusion of his botanical survey of the refuge (See Section D.5.).

15. Animal Control

Predator control for the purpose of protecting nesting areas of the threatened piping plover was conducted by refuge staff and Virginia Department of Game and Inland Fisheries research biologist. In accordance with the approved annual predator control management program, trapping commenced just prior to the birds arrival (March 1) and concluded by the end of the hatching period (mid-July). Removal of predators (red fox and raccoon) was accomplished by using both leg-hold and live traps. All control measures were confined to plover nesting areas on the beach and one impoundment. A total of 55 raccoons and 22 foxes were trapped and disposed of this year.

16. Marking and Banding

As part of a three year study initiated on the refuge population of the threatened piping plover, 22 adult and 26 prefledged plovers were banded this season. Birds were banded with a combination of three colored plastic leg bands and the regular Service's aluminum band. The colored plastic leg flag used in previous years was discontinued because they were suspected of causing leg injuries.

17. Disease Prevention and Control

Control measures were taken to prevent the spread of eastern equine encephalitis. See Section F.10 for details.

H. PUBLIC USE

1. General

For the second straight year, refuge visitation dropped to 1,382,775, a decrease of 38,791 visits from 1988. As in past years, approximately 52 percent of this use occurred in the three month period June through August. This decrease occurred despite the fact that the Memorial Day and Fourth of July weekends were the second busiest on record. August and September accounted for most of the overall decline because they brought exceptionally heavy rains and flooding to the local area. See Tables 2, 3 and 4 for public use visitation figures.

Table 2: TOTAL REFUGE VISITS

Months	1987	1988	1989
January	44,703	32,971	38,492
February	39,637	36,084	32,744
March	53,909	45,640	63,739
April	93,125	89,147	84,565
May	132,731	93,319	138,189
June	194,327	197,302	175,114
July	323,327	264,655	294,167
August	307,407	290,355	247,262
September	180,697	168,746	129,742
October	102,019	100,744	100,635
November	60,726	68,233	55,044
December	35,672	34,370	23,082
TOTALS:	1,568,604	1,421,566	1,382,775

Table 3: PUBLIC USE VISITATION FIGURES 1987 - 1989

	1987	1988	1989
Refuge VCS	82,198	94,683	109,872
Toms Cove VCS	93,408	101,090	70,611
VCS Auditorium	-	9,096	14,360
FWS Auditorium	4,953	6,021	4,126
NPS Auditorium	9,241	8,994	5,850
FWS Guided Walks	2,712	4,199	3,190
NPS Guided Walks	3,311	3,065	2,264
FWS Special Programs	284	540	426
NPS Special Programs	1,045	480	610
Concession Tours	12,862	14,021	14,442
Oil Shed Exhibit	7,283	7,642	7,820
Waterfowl Week Visits	25,352	28,726	27,393
Deer Hunt Visits	1,663	2,101	1,993

In many ways 1989 was a year when the refuge staff made a concerted effort to upgrade its public use program with more organization and a number of important changes. In addition to information presented elsewhere in this chapter, the following improvements were noted:

- The refuge auditorium was substantially reorganized and all materials/equipment not required to conduct programs were removed.

- A new office area was established in the sub-headquarters building for Recreation Assistants and interpretive volunteers to facilitate more interaction with other staffers and change the former office in the visitor center to a work/break room for staffers working there.

- A new visitor center operations manual was developed to clarify and standardize the responsibilities of employees and volunteers working in the center.

- Standard computer letters were written to help streamline the process of answering the refuge's many public inquiries.

- A new slide cataloging system was developed for refuge slides which were transferred to a different storage system.

- Public use/interpretive files were substantially reorganized and upgraded.

- Position descriptions for all public use staffers were rewritten to better reflect current job responsibilities.

Table 4: PUBLIC USE ACTIVITIES - 1989 MONTHLY VISITATION FIGURES

Activities	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEPT	OCT	NOV	DEC	TOTALS
VCS	1893	1353	5289	8104	9989	13597	19975	18694	11598	10970	7373	1037	109,872
VCS Auditorium	99	-	532	1229	1230	1633	2268	3263	1735	1373	861	137	14,360
Refuge Auditorium	-	-	-	332	414	621	1060	1208	491	-	-	-	4,126
Guided Walks	-	-	-	212	228	422	538	778	411	304	297	-	3,190
Special Programs	29	12	-	56	143	-	-	25	70	80	11	-	426
Concession Tours	-	-	-	307	746	2266	4093	3914	2099	1017	95	-	14,442
Oil Shed Exhibit	-	-	-	-	420	763	2150	1630	1130	987	740	-	7,820
Deer Hunt Visits	-	-	-	-	-	-	-	-	-	750	699	544	1,993

- Work began on developing a new refuge film list and a refuge "fact sheet" to use for staff training and briefing VIP's.

- Interpretive program evaluation forms were developed and utilized for refuge staffers and concession employees.

- Refuge brochures and flyers were all consolidated in one location. Other storage areas were cleaned and organized to enable better utilization of interpretive resources.

- Film/video resource information was updated and a card file of appropriate films available for sale or loan was established.

- A current inventory of the refuge's extensive artifact collection was completed.

- An inventory of refuge audiovisual equipment and supplies was completed to outline purchase/replacement needs and maintenance requirements.

The refuge attempted to issue news releases on a more regular basis as part of its expanded public relations efforts. During the year twenty-one articles were sent out covering such topics as refuge hunt programs, piping plover management, public use activities, waterfowl, the North American Waterfowl Management Plan, refuge visitation and the fee program. At various times throughout the year, refuge staffers also answered media inquiries and provided reporters with background information for articles about the refuge. The refuge continued to broadcast updated visitor information over the 1610 AM radio station.

The Chincoteague Volunteer Fire Company's annual pony swim and auction held in July once again attracted thousands of people to Chincoteague and Assateague Islands. This year a record number of foals were auctioned off including one for approximately $2,500, the highest amount ever bid for a young colt.

The refuge was authorized to spend $15,000 on new refuge signs this year. Refuge staffers spent considerable time evaluating, discussing and developing a package of 96 different information signs that were ordered from the Winona Sign Shop in June. The package included signs for the hunt program and Waterfowl Week as well as a host of trail and directional signs designed to replace almost every old, in-house produced sign on the refuge. The new signs (191 total), which were received in October, cost a total of $15,001 (Winona forgave the $1 debt). Although the package was the largest single order ever completed by the Sign Shop, refuge staff found significant errors on only three signs that were returned for correction. Sign standardization has

dramatically improved the appearance of the refuge to visitors.

Ponies head for Assateague Channel for the annual swim.
NR-89-30 7/89 TRE

In June the public use staff participated in interpretive training sessions that, for the first time, were coordinated by and involved both refuge and seashore personnel. The interagency sessions proved to be quite valuable since they gave participants an expanded opportunity to exchange ideas and improve techniques.

2. Outdoor Classrooms - Students

The Marine Science Consortium (located near the NASA Goddard Space Center) conducted most of the environmental education activities that occurred on the refuge, utilizing the beach and Toms Cove areas to study intertidal biology and the Woodland Trail to study maritime forest ecology. During the year 2,418 pre-college students spent a total of 13,467 hours on the refuge.

Special permits were also issued to a number of school classes to conduct environmental education programs on the refuge. In all, 221 students spent 884 hours participating in outdoor classroom activities.

3. Outdoor Classrooms - Teachers

The refuge was again utilized by the Marine Science Consortium that conducted teacher workshops entitled "The Marine Environment as a Living Classroom". Participation increased significantly over 1988 with 739 visits totalling 3,802 activity hours.

During the fall refuge staffers completed a draft environmental education teacher packet and a trail guide for classroom use on the Marsh Trail. The packet contains wildlife-oriented education games and activities for elementary and secondary age students as well as a film list and fact sheets about refuge management and wildlife. These materials will be made available to teachers in 1990.

4. Interpretive Foot Trails

During the year two trails were renamed to better reflect their natural character, routing and type of use. The Wildlife Drive was changed to the Wildlife Loop and the Pony Trail is now called the Woodland Trail. Three previously unnamed overlooks (Wild Pony, Snow Goose Pool and Marsh Trail) and one trail (Black Duck) were also identified. The new names are used on all official brochures, flyers and exhibits. Six main trails now exist on the refuge. The Wildlife Loop (3.2 mi.), Woodland Trail (1.6 mi.), Swan Cove Trail (1.2 mi.) and Black Duck Trail (1 mi.) are all paved and wheelchair accessible for hikers and bikers while the Marsh and Lighthouse Trails are unpaved foot trails only.

Wilderness Graphics of Florida was contracted in 1988 to develop a package of interpretive exhibits for refuge trails and public use areas. Although the initial site visit by the contractor occurred in January of this year, the fiberglass embedded panels were not completed and installed until December. Nevertheless, the five roadside/trailside exhibits and four orientation panels were completed without error and add much to the professional look of the refuge. Staffers are especially pleased with the attractiveness of the exhibit structures because they complement the NPS exhibits along the beach road. The package includes an after-hours kiosk in front of the refuge visitor center, three "You Are Here" orientation kiosks located at key trailheads and five interpretive panels (three on waterfowl for the Wildlife Loop and beach road, one on the Delmarva Peninsula fox squirrel for the Woodland Trail, and one on the piping plover for the "Assigned Area"). The exhibits provide some needed and long overdue interpretation for visitors enjoying refuge trails on their own. Interpretive exhibits will be completed for the Lighthouse Trail in 1990.

Maintenance staff assist Wilderness Graphics representative erect wayside exhibit.
NR-89-31 12/89 TRE

In May, refuge staffers helped Jack Smollens, a wood sculptor from Pennsylvania, install a custom made bench along the south side of the Wildlife Loop. The bench, donated by the Committee to Preserve Assateague Island in memory of former member John Bird, is a beautiful unit made of osage orange wood that will be enjoyed and appreciated by visitors for years to come.

5. Interpretive Tour Routes

The Wildlife Loop (formerly the Wildlife Drive) is a hiking/biking trail and also opens to vehicles from 3 PM to dusk each day. This year the route provided opportunities for self-guided interpretation with the addition of an orientation kiosk and two trailside exhibits. (See Section 4, Interpretive Foot Trails.)

The refuge's annual Waterfowl Week was held from November 18-26. During this time visitors were again permitted to drive a 7.5 mile portion of the refuge Service Road to see wintering waterfowl and other wildlife in an area not normally open to the public the rest of the year. This year 6,401 people took advantage of the opportunity, a decrease from the 7,090 in 1988 caused by a 1 1/2 day closure of the road due to rain and muddy conditions.

Wayside exhibit overlooking A-pool.
NR-89-32 12/89 TRE

Orientation kiosk adjacent to Swan Cove Trail.
NR-89-33 12/89 TRE

Island Cruises, Inc. the refuge concessionaire, again conducted interpretive tours (Wildlife Safaris) on the service road and narrated boat rides (Osprey Cruises) around the south end of Assateague Island from April to November (see Section 19).

6. Interpretive Exhibits/Demonstrations

Again this year the refuge visitor center experienced a substantial rise in visitation. Staffers and volunteers provided information and service to 109,872 visitors, 15,189 more than in 1988. Part of this increase was probably due to expanded hours of operation during the summer (8-5). The center's mini-auditorium also increased in popularity with 14,360 visitors (a 58% increase over 1988) viewing regularly scheduled nature videos.

The refuge visitor center upgraded its interpretive services to the public with more items for the touch table and the relocation of various exhibits to increase their prominence. Historical hunting decoys were removed from behind the information counter in favor of the Audubon Naturalist Society's photographic display on birds, expanded to stay up year-round rather than being changed seasonally. A "Take Pride" exhibit that focused on volunteerism was also designed and put up in the visitor center. Finally, to better utilize available floor space and improve traffic flow, a small carvers exhibit from the Ward Foundation and the large, broken floor map case exhibit funded by the cooperating association was removed.

In November the refuge sent to the Regional Office a write-up on its needs for a new visitor center/headquarters complex to be used in the development of a promotional information package that should help gain support for the new facility. In December, refuge personnel met with and provided information to officials from Inside/Outside, the interpretive design firm hired to complete the package early in 1990.

Refuge personnel and volunteers staffed information booths at several area art/wildlife-related shows using portable Service exhibits on Refuges and the North American Waterfowl Management Plan as well as refuge wildfowling artifacts. Brochures and activity flyers were also distributed to interested persons. Shows attended included the Salisbury Sportsmen's Expo, Chincoteague's Easter Decoy Show, the Deborah Waterfowl Festival and the Ward Foundation Decoy Festival. More than 3,700 people were contacted at these events. Unfortunately, very few of those contacts were made at Chincoteague's Easter Decoy Show since the refuge was given a very poor display location.

Various refuge wildfowling artifacts continue to be on loan to the Smithsonian Institution as part of its "Legacy Endures" exhibit that is traveling around the country through late 1990.

The Oil Shed Art Exhibit Program featured the work of various wildlife artists at the Assateague Lighthouse during 27 weekends and pony penning week this year. The fact that more than 2,500 people walked to the lighthouse in July alone is evidence of the popularity of the program. To help promote the program, an activity poster was developed for display in the visitor center.

7. Other Interpretive Programs

Scheduled marsh, bird and history walks were again offered to the public this year. For the first time, however, volunteers took an active part in leading these walks after attending an interpretive training session in July. The program was quite beneficial to the refuge, the volunteers and the public. A variety of evening lectures and slide programs were held in the auditorium on such topics as endangered species, birds, mammals, refuge management, and cultural resources.

Recreation Assistant Rose Moore leads an interpretive walk on the Marsh Trail.
NR-89-34 5/89 REW

The weekly "Assateague Adventures" volunteer lecture series was again hosted in the refuge auditorium. Approximately ten different programs were conducted covering coastal ecology, local history, shorebirds and wildflower photography. Apart from the series, another local historian voluntarily gave a talk on the history of the Eastern Shore to 43 members of the Society of Women Geographers.

The Junior Refuge Manager program for 6-10 year old children continued to be a popular summer activity in 1989. The program required each child to attend four interpretive activities plus the Junior Refuge Manager session. Seventy-two children completed the program and received an iron-on sticker and a special certificate. A similar number of 2-5 year-olds also participated in activities as part of the weekly "Kids and Critters" program.

In August special activities were conducted to celebrate the 200th anniversary of the Lighthouse Service in the United States. The U.S. Coast Guard opened the Assateague Lighthouse for tours. Despite some rainy weather more than 1600 people walked up the lighthouse. Special history walks were also conducted by refuge personnel. In addition, refuge and seashore personnel presented a joint campfire program that featured a special performance by ORP Petrocci as a shipwrecked pirate.

In July, ORP Edgerton gave a presentation on interpreting predator management at the predator management workshop which was part of June's project leaders meeting.

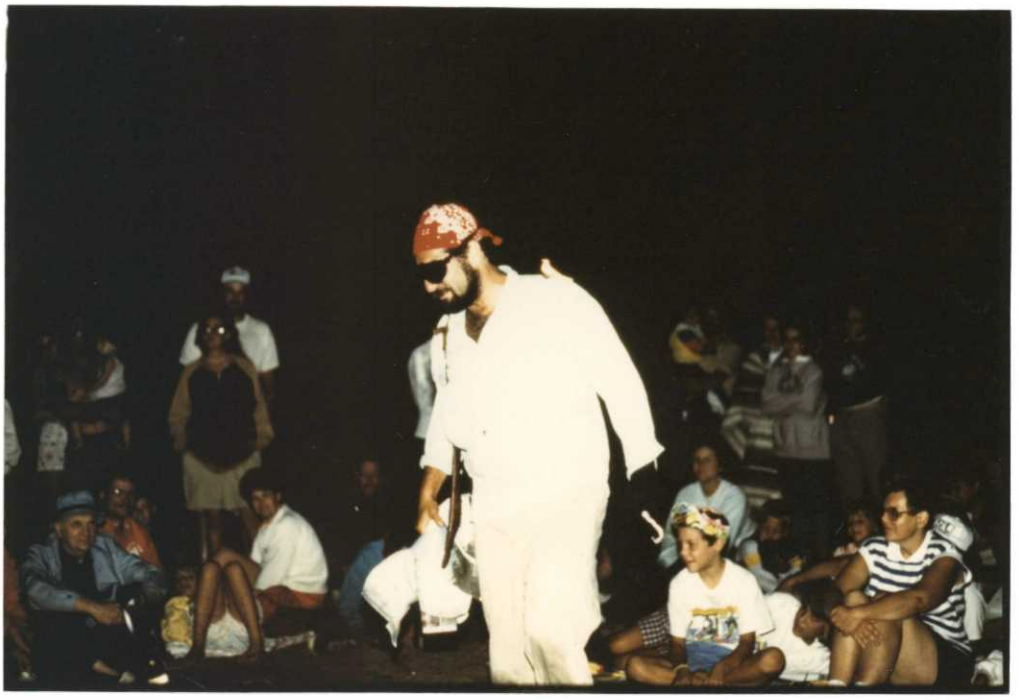
During National Wildlife Week refuge Recreation Assistants travelled to three local schools and presented 10 programs to 295 students. Also during the year, public use personnel conducted nine special nature walks on the Marsh Trail for a total of 183 students from area schools. Other programs were presented on request to senior citizens groups, scout troops and volunteers.

ORP Petrocci attended a job fair and served as a judge for the science fair at Arcadia High School. ORP Kenyon and Manager Schroer attended special March-of-Dimes breakfasts with representatives of businesses that participated in May's Walk-A-Thon on the refuge.

8. Hunting

Deer hunting on the refuge was limited to sikas only for the third consecutive year. The daily bag limit was again set at two deer per day with a season total of four permitted. However, a hunter was considered bagged out for the season if he/she harvested two antlered sikas.

Special tours of the Assateague Lighthouse helped celebrate the 200th anniversary of the Lighthouse Service.
NR-89-35 5/89



ORP Petrocci presents his pirate routine at a NPS/FWS campfire.
NR-89-36 8/89 REW

In late summer more than 700 hunt applications and information packets were distributed to the interested hunters. The result was more than 450 permits issued for the archery hunt. One hundred eighty of those hunters showed up on opening day. The firearms hunt lottery drew 352 applications of which 136 were selected to fill the available hunt areas.

In an effort to reduce staff time involved in the hunt program, lessen disturbance to waterfowl, harvest more deer and better meet other management objectives, numerous program changes were implemented during 1989. The season for the firearms hunt was reduced from six to four weeks. Each firearms hunt week was split into a 3-day and 2-day hunt which increased the total number of hunters potentially harvesting deer. In addition, hunt areas were further subdivided (increasing the number from fourteen to seventeen) and area vacancies were filled with standbys during Sunday orientations rather than wasting staff time trying to call and then orient standby hunters. The archery hunt was reduced from four to three weeks with the first and second week separated by a non-hunt week.

The result of the above changes was a deer harvest for the archery and firearms seasons of 48 and 282 respectively, an increase over last year's total harvest of 221. Bag limit modifications, which were first implemented in 1988, continue to achieve management goals since female sikas represented 69 percent of the total harvest. See Tables 5 and 6 for more specific deer hunt data.

Refuge waterfowl hunting took place on Wildcat Marsh, located on the extreme northern end of Chincoteague Island, and the newly acquired Morris Island, located between Chincoteague and Assateague Islands. The Wildcat Marsh hunt program, which includes an area open to commercial guides by bid and areas open to the general public, remained unchanged from 1989. Waterfowl hunting on Morris Island was limited to Thursday through Saturday with a maximum of ten daily hunt permits available to the general public.

Due to the inaccessibility of the waterfowl hunting areas and low hunter success, the demand for this type of activity was low. Only 19 permits were issued to the public for hunting Wildcat Marsh, although 14 permits were available every day of the state waterfowl season. In addition, only 8 permits were issued during the entire season for Morris Island when 10 were available each day the area was open.

Standby hunter Ken Dulik was lucky enough to bag a trophy sika.
NR-89-37 12/89 TRE

9. Fishing

Salt and freshwater fishing continued to be relatively popular activities on the refuge. Since Assateague Island is considered tidal, a state fishing license is not required to fish. Swan Cove was open to fishing for white perch and most of the activity occurred along the beach road near the Woodland Trail. Saltwater fishing was most popular on the refuge, especially along the beach and Toms Cove. Species such as flounder, weakfish, spot, blue fish, red drum, and shark were the most sought after game fish. Overnight fishing permits were issued to surf fishermen to fish after 10 PM. As always, crabbing was a popular family activity especially from May through September in Swan Cove, Toms Cove and Assateague Channel. Some visitors also enjoyed clamming in Toms Cove.

11. Wildlife Observation

Encouraging wildlife observation on the refuge is always a high priority. The refuge offers visitors many opportunities to see a variety of wildlife. The Wildlife Loop continued to be perhaps the most popular area to see waterfowl, wading birds and other incidental species. A boardwalk on the east side of the drive leads to an observation deck that gives an excellent view of a freshwater impoundment and its wildlife.

The Marsh Trail leads from the visitor center parking area to an observation deck with a good view of marsh habitat on the west side of the Wildlife Loop. Since the trail passes through a forest and brushy habitats, it is an excellent place to see a variety of wildlife.

The Woodland Trail (formerly the Pony Trail) offers good opportunities to birdwatch and see the endangered Delmarva Peninsula fox squirrel. The trail also includes a boardwalk that leads to a deck overlooking a salt marsh. Since the name "Pony Trail" deceived many visitors who ventured there seeking ponies, the name was changed to the Woodland Trail to reflect the kind of habitat the trail winds through. However the overlook has been named the Wild Pony overlook since it provides a view of the Black Duck Marsh area where a large number of the ponies are contained.

The Lighthouse Trail provides visitors with a chance to see wildlife on their way to the historic Assateague Lighthouse. The trail passes through a secondary growth loblolly pine forest and an ancient dune ridge that offers a view of Assateague Channel, the town of Chincoteague, and a native village site.

The Swan Cove Trail passes through a transition zone that includes dunes, marsh, brush and forest habitats. This trail is a good place for bikers and hikers to view wading birds and certain other species not readily found in other areas of the refuge.

The Black Duck Trail connects the Wildlife Loop and the Woodland Trail via a dike that divides two impoundments, providing excellent opportunities to see waterfowl and other wetland species.

12. Other Wildlife Oriented Activities

Photographers, both amateur and professional, found the refuge an ideal place to "capture" natural beauty and the daily activities of many wildlife species. Paved roads and trails gave the ambitious "photo bug" many opportunities to get excellent pictures, especially since wildlife was often seen along roadsides and trail edges. Spectacular sunsets and the ponies were primary subjects for many visitors.

Table 5: DEER (SIKA) HUNT STATISTICS (1988-1989)

	Archery		Firearm		Firearm Wheelchair		Total	
	1988	1989	1988	1989	1988	1989	1988	1989
# Hunters	288	325	108	178	6	7	402	510
% Successful	17	17	64	68	100	71	31	55
# Took 1	43	40	27	40	0	2	70	152
# Took 2	6	4	16	33	1	2	23	62
# Took 3	1	0	15	28	3	1	19	48
# Took 4	0	0	11	20	1	0	12	20
Hunter Hours	7,185	7,568	2,285	3,041	108	118	9,578	10,727
Deer Harvested	58	48	148	273	15	9	221	330
Hours Per Deer	123.9	157.7	15.4	11.1	7.7	13.1	43.3	32.5

Table 6: HUNT STATISTICS - BAG COMPOSITION (1987-1989)

	Sika Male			Sika Female		
	1987	1988	1989	1987	1988	1989
Archery	38	32	28	20	26	20
Gun	74	52	71	65	96	202
Wheelchair	7	7	2	5	8	7
Total	119	91	101	90	130	229
Percent	57	41	31	43	59	69

13. Camping

No camping was permitted on the refuge but the National Park Service maintained campgrounds on the Maryland portion of the island. Back country permits to hike to and camp in those areas were issued by National Park Service personnel at the Toms Cove Visitor Center.

14. Picnicking

Picnic tables were provided and maintained by the National Park Service at several of the beach parking lots and along a very small section of the Beach Road.

15. Off-Road Vehicling

Off-road vehicle (ORV) use was restricted to four miles of beach on Toms Cove Hook. The traffic limit for this zone, referred to as the oversand area, was 48 vehicles at any one time. However, the area provided nesting habitat for the piping plover, a threatened species. To minimize disturbance and aid in the recovery of the plover, a 2.5 mile section of the ORV zone was closed to all vehicles, boats, and hikers from March 15th through August 31. During this time, use in the remaining open area was limited to a maximum of 18 vehicles at any one time. Many ORV users also participated in surf fishing.

The refuge offers excellent wildlife photo opportunities to amateurs and pros.
NR-89-38 12/89 TRE

ORV's used on the refuge meet strict vehicle specifications and safety requirements. Annual oversand permits are issued at refuge headquarters and the National Park Service Toms Cove Visitor Center at a cost of $30.00. Maps and other information on the closures is also available at those areas and the refuge visitor center.

16. Other Non-Wildlife Oriented Recreation

Swimming, sunbathing, shell collecting, horseback riding, and boating were popular activities for many people, perhaps as many as one-half of the refuge's summer visitors.

The beach received heavy use when summer returned and temperatures rose. Swimmers and sunbathers crowded the protected beach to enjoy the surf and sand. Only a very small percentage of beach users ventured out of the protected area to beach comb, hike, fly kites or surf.

Boaters were permitted to come ashore only at Assateague Point and at Fishing Point on the southern tip of Toms Cove Hook (except when closed during the piping plover nesting season).

17. Law Enforcement

The 1989 law enforcement program was operated by one full-time and three seasonal refuge officers in addition to three employees who have law enforcement authority as a collateral duty. The seasonal employees began as early as mid-April with one leaving in early September and the remaining two working through December. From Memorial Day through Labor Day, the majority of the enforcement work was spent on traffic control, visitor protection and safety, as over 750,000 visits were made to the refuge during this period. This high public use was managed partially by having a highly visible and available enforcement staff. The fall enforcement program was centered around detecting wildlife violations with special emphasis on rail, waterfowl and deer hunting. Refuge Officers continued to issue Notices of Violation in the field, with the exception of wildlife cases, which were recorded on pink slips due to the complexity of some of the cases.

The refuge and the National Park Service (NPS) are currently operating under a Memorandum of Understanding, by which the NPS administers public use on the southern portion of the refuge known as Toms Cove Hook. Based on this understanding, the NPS assists the refuge enforcement program by having park rangers stationed in this area. These rangers deal mainly with beach oriented visitor services and protection. On occasion the park rangers call on refuge officers and vice versa for back up and other assistance.

The National Capital Naturist, a group that promotes social nudism, submitted a request to the refuge for a permit to include, among other things, going nude, while having a gathering on the beach. The refuge denied the permit and the organization then appealed the decision to the Regional Office, which also denied the permit, because the permit would have violated a county ordinance which prohibits public nudity. In a related case, U.S. Magistrate Victor Laws III, recently handed down an 18 page decision, which upheld the refuge's authority to enforce the county ordinance under 50 CFR 27.83 (indecency or disorderly conduct as defined by State or local laws). The decision stems from a case in which a Washington, DC woman was issued a Notice of Violation for going topless on the refuge beach.

The following is a breakdown of law enforcement work for 1988 and 1989 (figures include FWS and NPS activity):

	1988	1989
Incidents		
Injured Wildlife	5	4
Lost Persons	17	27
Vehicle Accidents	7	10
Visitor Assists	250	229
Bicycle Accidents	10	6
Fatalities	0	0
Actions		
Verbal Warnings	1200+	1200+
Notice of Violations	253	292
State Summons	4	2
Arrests	8	14
Resource Violations		
OSV Permit/Equipment	61	48
Trespass	102	90
Walking on Dunes	200+	200+
Camping	1	3
Pets	42	22
Litter	6	8
Firearms	2	3
Illegal Fire	0	1
Fireworks	3	13
Petting/Feeding Wildlife	200+	200+
Collecting Wood	5	4
Fishing Closed Area	2	2
Spotlighting	11	3
Metal Detector	7	10
Hunt Permit Violations	17	11
Possess Lead Shot	0	3
Hunting After Hours	0	2
Unsigned Duck Stamp	0	13
Take Protected Species	0	2

Conduct Violations	1988	1989
Public Intoxication	2	14
Underage Alcohol	23	19
Controlled Substance	14	6
Nudity	16	23
Larceny	6	4
Disorderly Conduct	1	0
Damage Government Property	1	1
Theft Government Property	2	0
Fugitive From Justice	1	0
False Information	0	1
Possession of Weapons	0	1

Vehicle Violations	1988	1989
DUI	4	13
Parking	68	76
Speeding	600	347
Reckless Driving	1	1
No Operator's License	7	1
Illegal Passing	28	22
Radar Detector	9	17
Improper Child Restraint	2	0
No Helmet	2	18
Obstructing Traffic	6	53
No Registration	4	3
Driving on Suspended License	1	4
Careless Driving	6	3
Expired Tags	1	3
Moped Violations	7	5
Improper Transport of Passengers	25	11
Tinted Windows	0	2
Leave Scene of Accident	0	1
Fail to Comply With Sign	0	2
Racing	0	1
Illegal Boat Landing	0	32
Bicycles in Closed Area	0	7

In reviewing the above list, one would conclude that violations that deal with wildlife and/or hunting are on the increase; however, two things happened in 1989 to show this increase. Refuge staff made a concerted effort to patrol the Wildcat Marsh, newly acquired Morris Island and adjacent areas for possible waterfowl violations. In addition, National Park Service personnel also patrolled the water areas to the west of the refuge more heavily than in the past. Although the National Seashore boundary has always included these waters, this year was the first attempt to inform local hunters of this boundary. Combined FWS and NPS efforts to detect waterfowl violations also occurred.

18. Cooperating Associations

The period from October 1988 through September 1989 was the second full year of operation for the Chincoteague Natural History Association. Gross sales totalled $48,582.41, a decrease of $5,217.72 from FY1988. During the year the sales outlet's inventory selection underwent a major reduction and overhaul that strengthened its interpretive focus on refuge resources. Although the change contributed to the sales decrease, it also substantially reduced opposition from local booksellers.

Association donations to the refuge during FY1989 totalled only $2,175.00 and included exhibit structures for the Lighthouse Trail, audiovisual equipment repairs, nature videos, volunteer vests/nametags and other volunteer support. Due to various organizational and program changes, other planned donations (including more than $8,000 worth of items approved from a refuge "wish list") were delayed until FY1990.

In May the Association paid off the $6,000 balance of its start-up loan from the National Wildlife Refuge Association (NWRA). In an attempt to help strengthen its public image and support of the refuge, the Association became a lifetime member of the NWRA as well as a member of Chincoteague's Chamber of Commerce. Association personnel also staffed a booth at Chincoteague's Easter Decoy Show to provide information about the organization and the refuge.

The Association held three board meetings during the year but did not conduct an annual membership meeting due to a number of organizational difficulties. In September, President John Buckalew and Business Manager Mary Ann Kellam resigned from the board and by years end, replacements had not been found. In October, Chincoteague resident Joy Brown agreed to manage the sales outlet on a temporary basis although she worked hard to upgrade the outlet's item selection and Association bookkeeping methods. This year the Association also experienced some inventory problems and a substantially reduced membership. In addition, not a single issue of the Association newsletter "The Piping Plover" was published.

In December, the visitor center storage area was cleaned and reorganized to make more room for Association sales items and facilitate more efficient inventory taking.

In 1990, the refuge intends to help the Association conduct monthly inventories of sales items strengthen and localize board membership, and improve procedures for operating the sales outlet and conducting other Association activities. Hopefully these efforts will further stabilize the Association and lay the groundwork for its increased support of refuge interpretive goals.

19. Concessions

During 1989, 14,442 people took concessionaire-operated land and boat tours that brought in over $91,000.00 for the concessionaire. Gross receipts to the refuge totalled $4,352.00.

A contract was issued to construct a new alcove for the concession operation that improved visitor service and reduced congestion in the visitor center. The concession owner also hired a contractor to build a ticket counter in the alcove and put up a new sign identifying the tour operation. In addition, this year the concessionaire constructed a handicapped-accessible boarding ramp for the safari bus and provided a secure space for a wheelchair in the tour vehicle.

Just before the beginning of the busy summer season, Island Cruises hosted an enjoyable "moonlight" cruise on board the "Osprey" for the concession staff, National Park Service personnel and refuge employees that provided an opportunity for everyone to get better acquainted.

Periodically, members of the public use staff monitored and evaluated the tours for concession employees. In general, the programs provided good information about the refuge and were well received. In June, a one day training/orientation session was also conducted for concession employees to update them on refuge management activities, programs and plans for the future, and special wildlife concerns.

I. EQUIPMENT AND FACILITIES

1. New Construction

In an effort to exclude the Chincoteague ponies from a critical piping plover nesting area and a public use area, approximately 4.5 miles of new fence was installed during the year. In addition all fencing was tightened in order to keep the ponies in their designated areas.

2. Rehabilitation

Because of the expense and shortage of housing in the local community, the basement in Quarters 3 was prepared to house temporary employees. An electric cook stove and refrigerator were installed. Beds, chairs, lamps and cooking utensils were made available. This remodeling provided three additional areas within the quarters for temporary employees.

Refuge maintenance staff install barbed wire fence adjacent to North Wash Flats impoundment.
NR-89-39 5/89

New toilet partitions were installed in the Visitor Comfort Station, Building 85, during the month of March. The old partitions were deteriorated and rusted. The partitions, manufactured by Santana Products Company, are made of one inch thick solid plastic which is waterproof, corrosion-proof, impact resistant and resistant to marking with pens, pencils, lipsticks and other marking implements. The partitions were on GSA contract and carry a ten year warranty.

On June 16, Britton Construction, Inc. drove 22 new 8-inch diameter treated wood pilings adjacent to the old and rotten pilings that support the concession boat landing dock. The next day the refuge maintenance staff installed the 4"x6"x6' treated wood stringers and bolted them to the new pilings. The old pilings were removed.

A contract was awarded on August 8, 1989 to Lance J. Eller, Inc. of Tasley, VA in the amount of $119,000.00 to repair and repave one-half mile of beach access road. Work was to begin this fall; however, the Virginia Department of Highways lowered the weight limits on the bridge leading to Chincoteague from 27 tons to 17 tons which resulted in the postponement of this project until mid-May 1990.

A 75-foot boardwalk was constructed for Headquarters Building 49, making this facility handicapped accessible from the front

parking lot. The walk starts at the front parking lot and extends around the building to the rear door. Salt-treated lumber consisting of 4x4s, 2x6s and 2x4s were used for the construction.

In November, 91 new information signs were mounted and erected on treated 4x4 posts. The posts were painted with a dark brown stain. An average of 3 staff-hours per sign were used for a total of 273 staff-hours.

A purchase order was issued to Clark's Concrete, Chincoteague, Virginia in the amount of $1,000.00 to cut-out 27 square feet of concrete flooring in Building 100 and install anchor bolts and refinish the cut-out with cement. The table saw, band saw and drill press were then bolted to the floor. This completed job complies with OSHA Standard 2201 and 24AMO.

3. Major Maintenance

The motor on the air compressor in the shop, Building 100, was repaired in January. Tate Engineering, Salisbury, MD replaced the switch, installed a new motor kit and check valve.

Treated 4x4 posts and 1/2" stainless-steel cable was used to erect a fence across the Toms Cove Hook area on March 15. Area Closed and Bird Nesting Area signs were placed on the posts to restrict and prevent the public from entering that piping plover nesting area.

The three fee collection booths which had been moved and winterized were again moved back on-line and made ready for the fee collectors who started collecting entrance fees on March 17.

Engineering Equipment Operator Wilgus using the road motor grader along with Maintenance Workers Collins and Williams and Tractor Operator Marshall using the two farm tractors with disk and rake attached, spread, graded and worked some 321 ton of stone/slag, crush and run road material on the Service Road this fall. An additional 120 tons of road material is scheduled to be delivered in early 1990. The additional material was delayed due to recent weight limitations placed on the bridge leading to Chincoteague by the Virginia Highway Department.

In late November, the facility maintenance crew, utilizing two farm tractors with disk and rake attached, front-end loader/backhoe, 5-ton stake/dump truck and other dump truck borrowed from the National Park Service began work on the road/dike system of Will's Hole, Virginia Creek and Old Fields. These earthen trails had become severely deteriorated with deep ruts due to rain, wet conditions, high water levels and a high vehicle traffic load caused by hunters that were participating in the annual deer hunt.

One of several 504 projects completed this year.
NR-89-40 10/89 REW

Refuge maintenance staff erect one of the 91 new informational signs.
NR-89-41 12/89 TRE

Maintenance and repairs to the refuge vehicle/equipment fleet was a major item again this year. Listed below are a few of the major repairs.

-- $1,397.28 to rebuild the 4WD transfer case assembly and related components and replace the air compressor on 1985 AMC Jeep 4x4 I-135694.

-- $1,128.42 to install a new starter, check engine oils for metal residue, replace starter relay switch and repair a transmission oil seal leak on the 500C John Deere Back-hoe/front-end loader.

-- $600.00 to prime and repaint 1984 Dodge 4x4 1/2 Ton Pickup truck, I-135620.

-- $350.88 to replace all 48 teeth on the 8' wide Ford towed road rake.

-- $1,105.71 to replace the complete joint drive and clutch assembly on the 7' wide Woods tag-along mower.

-- $471.01 to replace the engine oil pan, oil filter and replace rusted transmission cooler lines on 1983 Chevrolet 4x4, 3/4 ton pickup truck I-135604.

-- $559.75 to replace rusted fuel tank and front vacuum switch on front of the 4WD assembly on the 1985 AMC Jeep 4x4, I-135694.

-- $486.16 to replace rotten radiator on the 1982 Dodge Van, 4x4, I-135487.

-- $1,500.00 to replace tailgate, left front side panel, prime and paint complete vehicle on the 1984 Dodge 4x4 1/2 ton pickup truck, I-135622.

-- $700.10 to replace front bumper and front grill on the 1984 Dodge 4x4 1/2 ton pickup truck, I-135622.

4. Equipment Utilization and Replacement

A 1989 Chevrolet 4x4 1/2 ton pickup truck was received on March 27. This new vehicle replaces the 1977 Chevrolet truck/delivery. The new truck is assigned to the Facility Management section.

A 1989 Chevrolet 4x4 Blazer was received on June 21. This new vehicle replaces the 1980 Chevrolet 4x4 Blazer. Law enforcement equipment was installed, and the vehicle assigned to that section.

A 1989 Chevrolet Celebrity, 4-door sedan was received on May 11. This new vehicle replaces the 1978 Chevrolet stationwagon and was assigned to the headquarters staff.

A new bench grinder purchased through GSA contract was received in October. The new grinder replaces a 22 year old one that did not meet current safety standards.

An acquisition request was sent to CGS and a purchase order issued to Motorola Communications for eight portable MT500 radios and two Mitrek radios. Total cost for all units was $6,233.39.

The refuge bulldozer was loaned to Eastern Shore Refuge on several occasions during the year.

5. Communication Systems

During the year the refuge radio system was upgraded with the purchase of eight Motorola MT500 portables and two Motorola Mitrek mobiles. The purchase of two battery analyzer/charger systems has increased the life of the portable radio batteries. The analyzer discharges the battery totally before recharging and also measures the amount of charge left in a battery.

6. Computer Systems

During the year the following ADP equipment was purchased.

-- Epson LQ850 printer for PC Limited 286

-- Memory Chip expansion 512K for PC Limited 286

-- Soft byte memory manager for PC Limited 286

-- Two volume SYSTAT/SYGRAPH version 4.0

J. OTHER ITEMS

1. Cooperative Programs

The refuge wildlife biologist, Ailes, was designated to develop a Waterfowl/Wetland Management Plan for the Naval Surface Warfare Center (NSWC) in Dalghren, Virginia. Ailes attended various meetings at NSWC and at Aberdeen Proving Grounds to discuss procedural techniques and objectives of the management plan. The final waterfowl/wetland management plan was approved in September by regional supervisors and was forwarded to the commander at NSWC for their approval and implementation.

An agreement with the National Aeronautics and Space Administration (NASA) authorized the U.S. Fish and Wildlife Service to provide technical assistance and to conduct a variety of wildlife management activities on Wallops Island. No major management practices were conducted on the island.

3. Items of Interest

The 1989 fall issue of Humane Society of the United States News featured an article on the Chincoteague Ponies. The article was very critical of the way the Chincoteague Volunteer Fire Company handles the pony penning and auction and of the Service for not imposing fines on the Fire Company for an apparent permit violation which occurred during the July roundup. The highly inflammatory and emotional article called for members to write the Assistant Secretary of the Interior and refuge manager requesting that the Fire Company be fined or that their grazing permit be revoked. The article was very misleading in discussing problems that were solved years ago and in regards to pony ownership since most people who wrote (over 300 letters) complained about things that are no longer problems or about why a volunteer group can sell federally owned animals. The special use permit for grazing was strengthened, and the fire company put on alert that future roundups would be delayed or cancelled if permit conditions are not met.

The refuge was also one of sixteen featured in a General Accounting Office report entitled "National Wildlife Refuges Continuing Problems Incompatible Uses Call for Bold Action". The report led to numerous calls from a congressional office for information and considerable concern from the local community.

The following was also accomplished during the period:

-- On January 26, Manager Schroer met with Chincoteague Chamber of Commerce officials, Wanda Thornton and Kelly Conklin, to discuss community concerns.

-- On January 31, Manager Schroer met with Judy Johnson, Committee to Preserve Assateague Island, Inc. to discuss the Committee's concerns about refuge objectives and to receive a donation of a hand made wooden bench to be placed along Wildlife Loop.

-- On February 2, Peter Elliot from RO-EN was on the station to conduct a preliminary survey for the beach road and boat dock rehab project.

-- On February 17, Managers Schroer and Wilson and Biologist Ailes attended a Beach Erosion Symposium sponsored by the Navy at Wallops Island.

-- On February 29 and March 1, ARD Young and Associate Manager McAndrews met with Manager Schroer to discuss a variety of refuge management issues.

-- On March 9, Manager Schroer attended a meeting at the U.S. Courthouse in Norfolk regarding a change in procedures for violation notices.

-- On March 27 - 31, Manager Schroer attended a Project Leaders/Team Building Session near Washington, DC.

-- On April 8 and 9 the Chincoteague Volunteer Firemen rounded up the ponies for their semi-annual blood test.

-- Manager Schroer discussed the recent acquisition of approximately 1,200 acres on Cedar Island with several county officials. No opposition was noted concerning the refuge managing the island; however, concern was expressed on federal ownership's impact on public use.

-- On May 1, Manager Schroer and Biologist Ailes attended a moist soil management meeting at Blackwater NWR concerning information about computer modeling used in impoundment management.

-- On May 7, the annual March of Dimes Walk-A-Thon was held. Over 3,000 walkers were sponsored and completed the 15 mile walk through the refuge.

-- On May 12, a meeting was held concerning the refuge's predator control program due to a letter written to the Wilderness Society. Questions and concerns were addressed and attendees left satisfied that predator control was needed to protect a threatened species (piping plover).

-- On May 21, Bill Refalt of the Wilderness Society and his wife were given a tour of the refuge by Manager Schroer.

-- On June 22, Manager Schroer met with Assateague Island National Seashore Superintendent, Roger Rector, to discuss potential flights for aerial photographs of Assateague Island.

-- On July 6, Manager Schroer provided a refuge orientation tour to Mr. Jose' Mendez, Assistant to the Minister of the Environment in Venezuela. Mr. Jerry Touval of Legislative Services accompanied Mr. Mendez.

-- On July 12 & 13, Chief of Refuges Bob Karges and ARD Don Young were given a refuge orientation tour to discuss refuge programs and concerns.

-- The Regional Safety Training Workshop was held the week of July 17-21 at Chincoteague Refuge. As part of the training the refuge was scrutinized by a 6 committee safety inspection team.

-- On July 24, ORP Edgerton presented a talk at the Predator Workshop/Project Leaders Meeting on interpreting refuge predator programs. Manager Schroer and Biologist Ailes also attended the Workshop.

-- On September 4, ARM Wilson provided a tour of the refuge for Helen Runnells, Special Assistant to the Director of NOAA and David Rivkin, White House Counsel to the President on the Environment.

-- On September 8, Manager Schroer gave John Rayfield, Aide to Congressman Herbert Bateman, a refuge tour and discussed management and public use issues.

-- On September 27, Manager Schroer met with Gail Eisnitz, Field Investigator, Humane Society of the United States to discuss the death of one of the ponies during the annual Pony Penning activities.

-- On October 6, Manager Melvin and Biologist Ailes attended a woodcock management meeting held at Eastern Shore NWR. Helpful information was gathered during the meeting to assist with the evaluation of Chincoteague's woodcock population and future management proposals.

-- On October 8, Manager Schroer provided a tour of the refuge and discussed refuge issues with Ginger Meese, Washington representative of the National Wildlife Refuge Association.

-- On October 11, Manager Schroer gave a tour of the refuge to Dr. Wolfgang Imming, Director of the Center for Protection and Improvement, German Democratic Republic (East Germany). Dr. Imming was touring the United States to learn more about environmental federal agencies and how they operate.

-- On October 17, Manager Schroer attended a meeting with conservation/environmental groups at the National Audubon Society's headquarters in Washington, DC to discuss long range planning, carrying capacity of the beach and refuge, ORV use, parking, shuttle system, local pollution and site selections for visitor center/administrative headquarters. The following organizations were present at the meeting: The Wilderness Society, Committee to Preserve Assateague Island, National Wildlife Refuge Association, Audubon Naturalist Society, Sierra Club, Environmental Defense Fund, National Parks and Conservation Association, and Defenders of Wildlife.

-- On November 20, Manager Schroer, ARM Wilson, and LE Officer Kessler met with Assateague Island National Seashore Superintendent Rector, Assistant Fagen, Chief Ranger Fitzgerald and Chief Interpretor Points to discuss the Memorandum of Agreement (MOA) on law enforcement and a revised Memorandum of Understanding (MOU).

-- On December 1, Manager Schroer attended a joint meeting between Chincoteague Community Leaders and Environmental/Conservation groups. The two organizations agreed that a joint letter should be sent to FWS Director Turner encouraging him to allow this station to master plan.

-- On December 20, Manager Schroer met with and provided a refuge tour for Art Hughlett, President of the National Wildlife Refuge Association and his wife. Pertinent issues, including the future site of a new visitor center/headquarters complex were discussed so that the Association could be better informed in providing support to the refuge.

4. Credits

Most employees "eagerly" awaited their assignment for this document, and they should be given their due credit as follows:

Sections		Employee(s)
	Table of Contents	Merritt
A.	Highlights	Schroer/Wilson
B.	Climatic Conditions	Ailes
C.	Land Acquisition	Wilson
D.	Planning	Schroer/Wilson/Ailes
E.	Administration	Schroer/Wilson/Ailes/ Melvin/Engelhart/ Merritt
F.	Habitat Management	Melvin
G.	Wildlife	Ailes/Reed
H.	Public Use	Edgerton/Kenyon/ Petrocci
I.	Equipment & Facilities	Bowden/Wilson
J.	Other Items	Melvin
K.	Feedback	Schroer
L.	Information Packet	Merritt/Mason

Editing was accomplished by several people; typing by Merritt, and proofreading by Wilson (and others).

K. FEEDBACK

After years of not being properly compensated, a step in the right direction was finally taken in recognizing the complexity of running the administrative functions of a National Wildlife Refuge. This step was in the form of changing the title of one position from Secretary, a title definitely not broad enough to cover the variety of jobs accomplished, to Office Assistant, a title that covers more territory but maybe not enough, and the same position was upgraded from a GS-5 to a GS-6, which was an improvement but still not enough when compared to the demands of the job. Over the years, refuge manager positions have been upgraded from being GS-9's and 11's to some that are now GM-14's, a result of the increasing complexity of the job. Clerical positions have also increased in complexity from the time the "clerk" would spend part of the day in the office and the rest in the field to the present day "clerks" who possess detailed knowledge of various administrative matters, such as accounting, procurement, property, personnel, etc. Unfortunately and unlike manager positions, "clerks" have not been given their fair recognition. The recent upgrades and change in titles is great but stopping short of making these positions professional ones would be a shame.

At the close of 1989, the prospects of resuming the master planning process for Chincoteague Refuge looked good. The process which was begun in 1984 came to a screeching halt in 1987 when local opposition developed, resulting in political involvement. The possible revitalization of the process is the result of the community leaders meeting with leaders of environmental/conservation groups, and a joint decision being made in favor of long range planning. The result was a joint letter being sent to Director Turner requesting that the process begin with total involvement by both sides. The refuge staff is optimistic about the prospects of long range planning in order to address the many issues that face this refuge; however, based on past complications, future attempts at master planning will need to proceed slowly and cautiously if a final product is to be realized. The local community is economically dependent on this refuge with the nearly 1.5 million annual visits. On the other hand, the refuge was listed by the Wilderness Society as one of the ten most endangered refuges in the nation, due to the volume of visitors and local pressures. With this in mind, master planning will be a challenge with many hurdles to jump and roadblocks to get around, any one of which could stop the process again.

Keeping up with needed maintenance, particularly large rehab projects, continues to be a problem and will continue to be one until a system is established for accomplishing recurring repairs on a regular recurring basis. Several systems have been tried over the years with little long term success. A case in point is the Beach Road on this station over which approximately 450,000 vehicles travel each year. This road has deteriorated to the point of being unsafe, and although the Regional Office sets this project at a very high priority, the funds provided seem to be diverted to other projects or reduced before the contract is awarded. Since this is not symptomatic of just the beach road project but of most large projects, a system to alleviate this problem would be to reserve a pool of funds, possibly at the Washington Office level, to take care of reductions in the budget or emergencies which seem to come up every year. Then once a project is funded, chances would be better that the project would be completed, and the Service would look more efficient in their planning efforts.

INTRODUCTION

The Cedar Island Division of the Chincoteague National Wildlife Refuge is located on one of the barrier islands on the eastern shore of Virginia. The island is approximately six and one-half miles long and is located in Accomack County. Currently, the Cedar Island Division consists of 1,244 acres of mainly salt marsh located on the north end of the island and 600 acres of conservation easements scattered throughout the island.

The properties were initially donated to the Fish and Wildlife Foundation by Ben D. Benson and Elizabeth Hall Benson. On November 9, 1987 these properties were leased by The Foundation to the Fish and Wildlife Service. On March 1, 1989, these properties were officially deeded to the Fish and Wildlife Service. Because they are located in Accomack County, administration is by the Chincoteague NWR.

The threatened piping plover and the state endangered Wilson's plover nest on the island. Large numbers of overwintering black ducks, as well as other waterfowl, can be found in the Cedar Island salt marshes.

Cedar Island has a diversity of ownership and use. In all, over 60 landowners exist on the island, most of whom own relatively small (3-5 acre) parcels. This island is the most developed on the Virginia coastal chain. Most of the northern section of the island has been subdivided. Nine newly constructed vacation residences have been erected on the northern part of the island since 1985. Approximately 20 smaller cottages have existed since the 1950s. An abandoned Coast Guard station is located at the northern part of the island. This facility is owned by a hunting club known as the Folly Creek Corporation. The Corporation also has hunting rights on approximately 1,300 acres of marshland, most of which is within the Cedar Island Division.

INTRODUCTION

TABLE OF CONTENTS

Page

G. WILDLIFE

H. PUBLIC USE

Page

I. EQUIPMENT AND FACILITIES

J. OTHER ITEMS

A. HIGHLIGHTS

The Cedar Island Division of the Chincoteague National Wildlife Refuge was established (Section C.1.)

Land acquired to protect waterfowl and shorebirds (Sections C.1. and 2.)

B. CLIMATIC CONDITIONS

For general climatic conditions of this area see the same section for Chincoteague National Wildlife Refuge. Being a very low and narrow barrier island, this island is constantly changing due to wind and wave action. The north end of the island is eroding very rapidly with accretion taking place on the south end.

C. LAND ACQUISITION

1. Fee Title

On March 1, 1989, 1,244 acres of salt marsh adjacent to Cedar Island were acquired through donation from The National Fish and Wildlife Foundation. The tract was conveyed to the Service subject to hunting rights having been conveyed to the Folly Creek Corporation by agreement dated November 5, 1966. The salt marsh is being used heavily by over wintering black ducks. See map on following page.

2. Easements

The Foundation also donated on March 1, 1989, approximately 600 acres of Conservation Easements on Cedar Island. The easements allow posting of critical bird nesting sites. As a part of the easement, the owners also agreed that they will make no use of the property which is inconsistent with the purposes of the donation.

D. PLANNING

6. Other

Due primarily to controversies surrounding the Hook closure on Chincoteague Refuge, the Cedar Island Division was initially going to be administered by Eastern Shore Refuge. However, the decision was made to put Cedar Island under Chincoteague which caused a congressional office to be quite concerned.

CHINCOTEAGUE NATIONAL WILDLIFE REFUGE

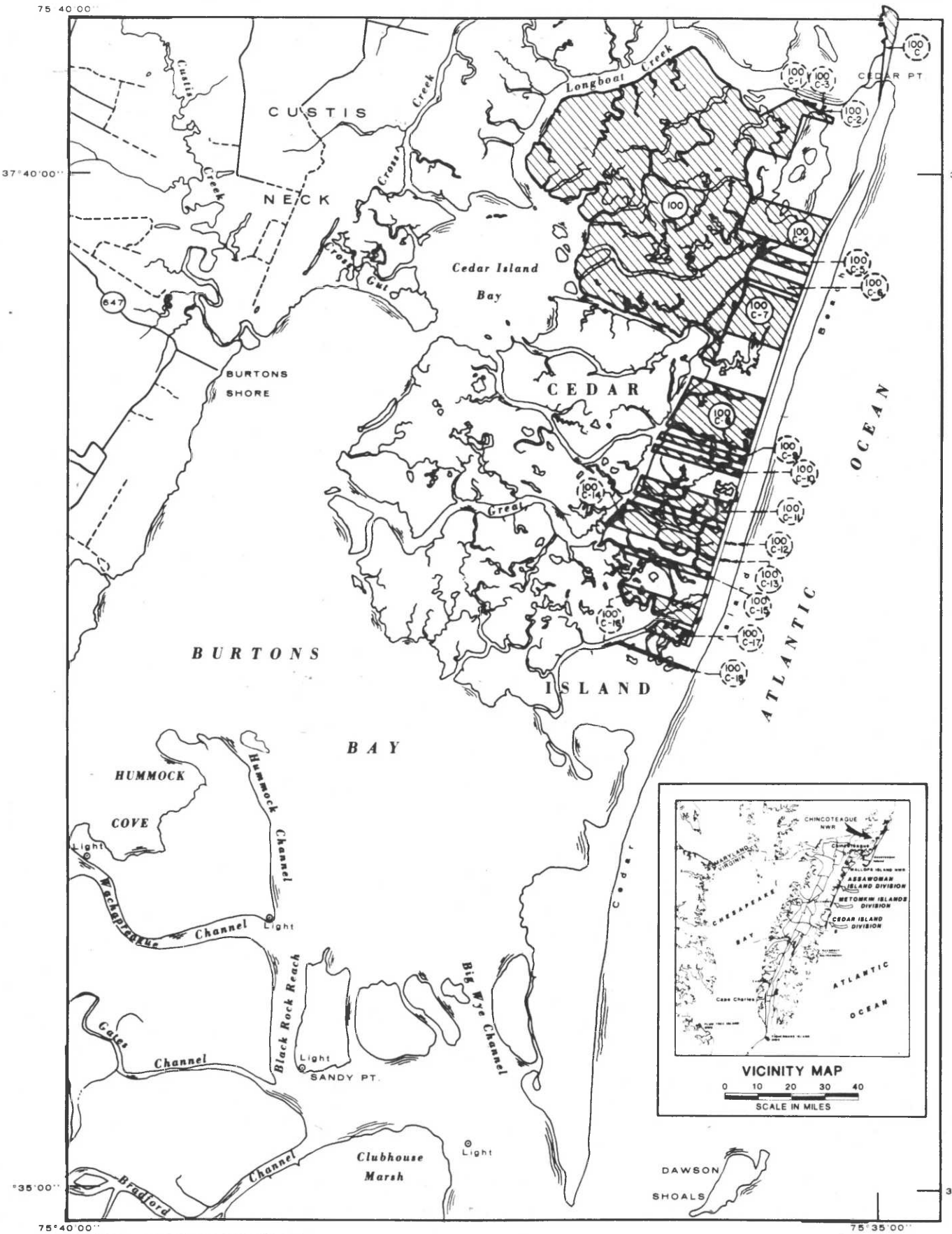
CEDAR ISLAND DIVISION

UNITED STATES
DEPARTMENT OF THE INTERIOR

ACCOMACK COUNTY, VIRGINIA

UNITED STATES
FISH AND WILDLIFE SERVICE

2



COMPILED IN THE DIVISION OF REALTY
FROM SURVEYS BY U.S.G.S. AND U.S.F.&W.S.

SCALE 0 2000 4000 6000 8000 FEET
0 0.5 1.0 1.5 2.0 KILOMETERS

8° MAG TRUE N MEAN DECLINATION 1979

FEBRUARY 1989
NEWTON CORNER MASSACHUSETTS
POSTED: 6/89

5R VA 383

Aerial view of Cedar Island Division salt marsh and a portion of the 6 1/2 mile long Cedar Island. Upper right is abandoned Coast Guard Station now Folly Creek Hunt Club.
NR-89-42 4/89 REW

Manager Schroer points out boundary of newly acquired Cedar Island Division.
NR-89-43 6/89 REW

This concern led to directives coming from Congress to do a historical public use survey and develop a public use plan for proposed future acquisitions of Assawoman and part of Metompkin Island. In an effort to reduce the controversy, Manager Schroer met with the Accomack County Supervisors to discuss the acquisition of Cedar Island.

E. ADMINISTRATION

1. Personnel

No personnel were directly assigned to the Cedar Island Division as staff of Chincoteague Refuge conducted the limited activities which occurred there in 1989.

5. Funding

Although no separate budget existed for this division, two projects were funded out of the Chincoteague Refuge budget. A posting project for $10,000 and a Cedar Island management project for $8,000 were both funded in FY 1989.

8. Other

NORTH AMERICAN WATERFOWL MANAGEMENT PLAN

The North American Waterfowl Management Plan -- an international agreement signed between the US and Canada in 1986 to protect, enhance, and restore wetland habitats across the continent -- presents a number of new opportunities and challenges for NWRs. The plan establishes conservation goals for wetland habitats in specific regions of the continent; sets objectives for restoring waterfowl populations, and provides a framework for accomplishing local, regional, and international goals.

In the United States, six key waterfowl breeding, migration, and wintering habitat regions, called Joint Ventures (JVs), have been established to implement the plan. In Region 5, The Lower Great Lakes/St. Lawrence Basin and the Atlantic Coast JVs, have coalitions of federal, state, and private partners working together to restore waterfowl populations.

The Cedar Island Division lies within the Atlantic Coast JV and is playing an active role in achieving the objectives of the JV and NAWMP.

NAWMP Activity Highlights

* The refuge acquired wetlands to protect black duck habitat. (See Sec. C.1 and 2)

F. HABITAT MANAGEMENT

1. General

Over 1,200 acres of the Cedar Island Division are considered salt marsh habitat. This area is interspersed with tidal creeks providing excellent black duck habitat. The remaining acreage consists primarily of sand dunes.

No habitat management was conducted and only limited management may occur to increase diversity of habitat types. Habitat management will never by a significant factor in the overall management of this refuge division since the major purpose of acquiring these lands was to protect and to conserve these dynamic barrier islands in their natural state.

G. WILDLIFE

2. Endangered and/or Threatened Species

One federally listed threatened species (piping plover) and one state endangered species (Wilson's plover) are known to nest on Cedar Island. During the summer, piping plover nest distribution and production surveys were conducted by biologists of the Chincoteague National Wildlife Refuge, the Virginia Department of Game and Inland Fisheries and the College of William and Mary. Surveys were conducted on foot covering the entire length of the Island. Observations were also made on other species nesting on the Island including least tern and Wilson's plover.

From surveys conducted in early June and a follow-up survey in early July, an estimate of total use and production was determined for the island. Most plover use was confined to the extreme northern end and at the southern half of the island adjacent to Great Gut Cove. All observations of pairs or single birds were recorded on a topographic map of the island.

Based on the collective data from all agencies conducting surveys on the island, an approximate breeding pair count for the island was determined as five pair with an estimated production for the island of six fledged young. A crude estimate of fledgling productivity for the island could be given as 1.2 chicks fledged per nesting pair. However, this population figure is only an estimate that was based on surveys conducted at approximately two week intervals and may not be the true population for the island.

3. Waterfowl

Although no formal surveys were conducted, the salt marsh provides valuable habitat for black ducks.

Large numbers of black ducks can be found using the marshes of the Cedar Island Division.
NR-89-44 Photo courtesy Richard H. Smith

H. PUBLIC USE

1. General

This year during the summer, periodic surveys of public use activity on Cedar Island were conducted by refuge personnel. Surveys were conducted by boat and focused on activity on the north and south ends of the island. Data were recorded on types of activity, number of people/boats observed, activity locations, time of day and weather conditions. Most surveys lasted only about an hour and occurred between 10 AM and 3 PM. Fishing and beach-related uses appeared to be the primary activities on the island. Surprisingly, activity was less than expected, although no "hard" assumptions can be made since overall use depends on a variety of factors including the day, time of day, weather and tides. Unfortunately, surveys were not conducted often enough to obtain an accurate picture of how island use varies with these factors. Refuge staffers did, however, gain valuable navigational experience since running aground seemed to be "rite of passage" to and from Cedar Island.

8. Hunting

Hunting did occur on the marsh; however, the Service does not control this activity. The hunting rights are owned by a private group, and the general public is not permitted to hunt this area.

9. Fishing

Saltwater fishing seemed to be a popular activity on and around Cedar Island. Although many fishermen concentrated in boats near the inlets seeking flounder, croaker, and sea trout, occasionally people were seen surf fishing on the beach having crossed over the dunes from their boats left on the bay side. Clammers were also seen working the numerous exposed mud flats.

15. Off-Road Vehicling

Several vehicles were observed driving on the beach on the south end of Cedar Island, not surprising since many people own homes on the island. However, the locals have also made an attempt to sign the area to encourage drivers to stay off the dunes. The beach and dune system of this island are primarily privately owned.

South end of Cedar Island
NR-89-45 8/90 TRE

16. Other Non-Wildlife Oriented Recreation

Swimming, sunbathing, boating, shell collecting and beach combing appear to be the most popular activities on Cedar Island. Numerous groups ranging in size from three to ten people were observed on several occasions with individuals engaged in all of these activities.

17. Law Enforcement

Cedar Island Division was recently acquired and because of icy conditions, boat patrol was not possible in the early part of the waterfowl season. Officers did work patrols with Special Agents during rail season and made several cases in the area around the Division for shooting from a boat under power.

J. OTHER ITEMS

4. Credits

The following individuals were involved in this report:

Section	Employee
Introduction	Schroer & Wilson
A	Schroer
B	Ailes
C	Wilson
D	Schroer
E	Schroer
F	Melvin
G	Ailes
H	Edgerton

Typing was accomplished by Merritt with Wilson doing the proofreading.

INTRODUCTION

The Wallops Island National Wildlife Refuge was created on July 10, 1975 when 373 acres of land were transferred to the U.S. Fish and Wildlife Service from the National Aeronautics and Space Administration, Wallops Flight Center. The refuge comprised mainly of salt marsh and woodlands is located east of Wattsville in Accomack County, Virginia and contains approximately 195 acres of salt marsh which benefits waterfowl, primarily black ducks. No public use is permitted on the refuge. This refuge is managed as a satellite of the Chincoteague National Wildlife Refuge.

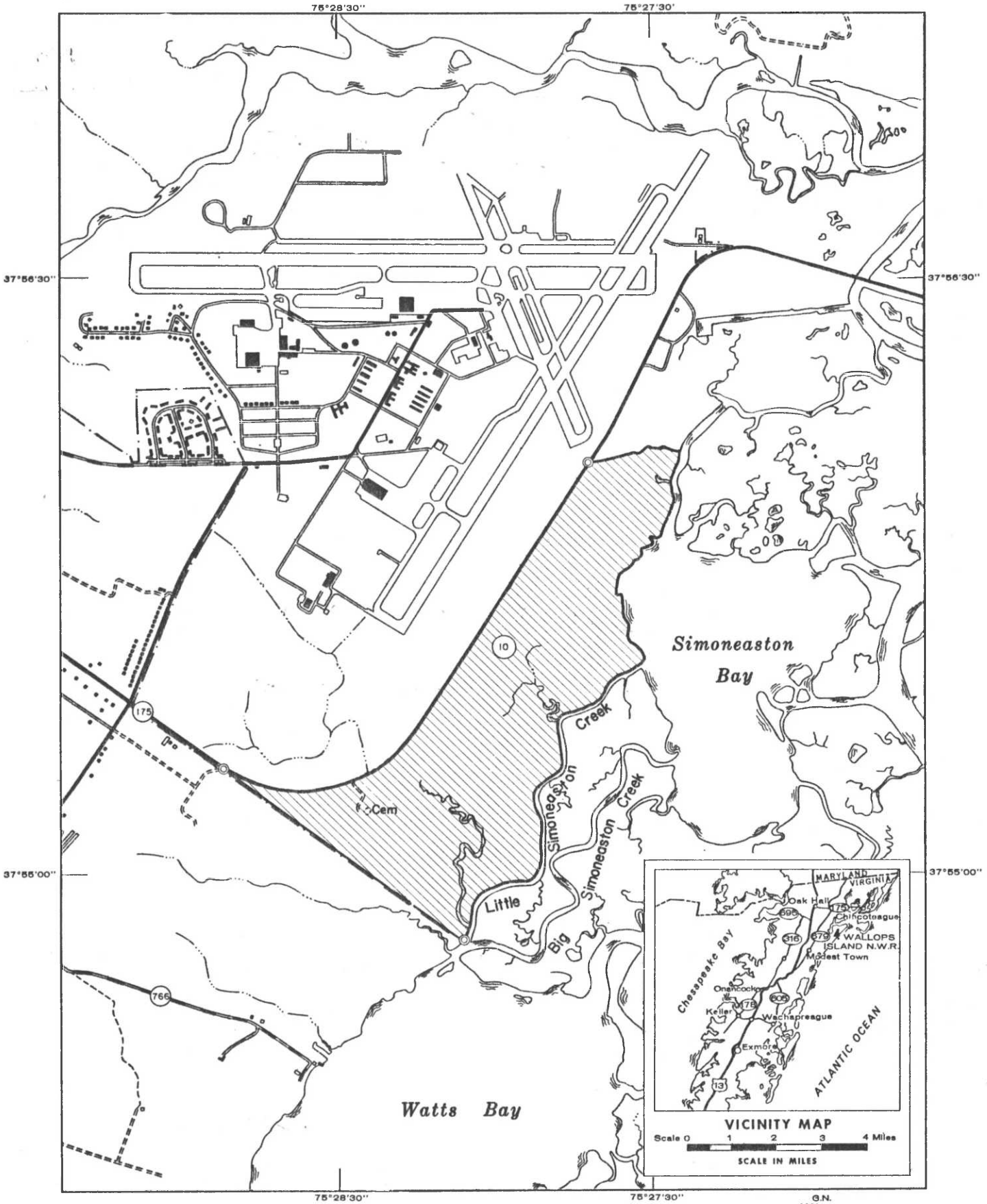
In addition, the U.S. Fish and Wildlife Service has an agreement with the National Aeronautics and Space Administration which allows the Service to use Wallops Island on a non-interference basis for research and management of wildlife species in special need of protection because of their diminishing numbers. Wallops Island is 3,000 acres of primarily salt marsh located south of Assateague Island in Accomack County, Virginia.

WALLOPS ISLAND NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

ACCOMACK COUNTY, VIRGINIA

UNITED STATES
FISH AND WILDLIFE SERVICE



COMPILED BY THE DIVISION OF REALTY
FROM SURVEYS OF THE U.S.G.S. AND THE U.S.F. & W.S.

0 1000 2000 3000 4000 Feet
0 .5 1 Kilometer

G.N.
M.N.
8° 0°16'
MEAN DECLINATION 1965

BOSTON, MASSACHUSETTS MARCH 1976
POSTED: 12/76

5R MA 861 500

INTRODUCTION

TABLE OF CONTENTS

Page

G. WILDLIFE

H. PUBLIC USE

I. EQUIPMENT AND FACILITIES

Page

J. OTHER ITEMS

B. CLIMATIC CONDITIONS

Weather conditions on Wallops Island National Wildlife Refuge are similar enough to conditions on the NASA mainbase that climatological data supplied by NASA for use on Chincoteague NWR are also used for these areas (See Chincoteague NWR narrative section B).

D. PLANNING

6. Other

In compliance with policies on cemetery management, a cemetery on Wallops Island Refuge was surveyed and maintenance needs determined. The minor work required will take place in 1990.

E. ADMINISTRATION

1. Personnel

Although no staff are assigned to this station, Chincoteague Refuge staff are used to support this unit.

7. Technical Assistance

Technical assistance to the National Aeronautics and Space Administration (NASA) was provided by the Chincoteague NWR's Wildlife Biologist to help identify active and potential piping plover nesting areas on Wallops Island (NASA). Recommendations were provided to NASA officials on closing specific sites to NASA and Navy personnel activity to protect and reduce disturbance to this beach nesting threatened species.

F. HABITAT MANAGEMENT

1. General

The refuge consists of three main habitat types which include saltmarsh (195 acres), forests (121 acres) and abandoned croplands (57 acres). Loblolly pine is the dominant tree species present along with a mixed deciduous forest of red oak, sassafras, wild cherry, dogwood and sweetgum. Understory species include sumac, wild grape, blackberry and honeysuckle. The transition zone from marsh to upland is dominated by wax myrtle and groundsel tree. The saltmarsh is almost entirely comprised of saltmeadow hay and cordgrass.

No active habitat management was conducted on this refuge during the year.

G. WILDLIFE

2. Endangered and/or Threatened Species

The peregrine falcon is the only known endangered species frequently observed on the island. A hacking tower, located on the northern end of Wallops Island, was not used this year.

Bald eagles may occasionally visit the island, but no data were available on this species' use of the island during 1989.

The piping plover and Atlantic loggerhead sea turtle are the threatened species found on Wallops Island. Loggerheads occasionally wash ashore dead or come ashore to nest. This year no turtle activity was reported.

Piping plovers nest on the beach at Wallops Island. To protect nesting birds from disturbance, NASA , on the recommendation of the refuge, closed sections of the beach to all activities by NASA and Navy personnel for the summer. A nesting survey conducted by refuge staff and state biologists in cooperation with the Virginia Department of Game and Inland Fisheries revealed at least up to five pair were nesting on the south end of the island. In addition, a pair of the state's listed endangered species, Wilson's plover, was also found.

3. Waterfowl

Waterfowl populations on both areas are limited to saltmarsh habitat and a few upland freshwater to brackish pools. No population surveys were conducted this year. Black duck, mallard, gadwall and green-winged teal are the most common species on the areas.

Some waterfowl production does occur on Wallops Island. The most frequently observed species were the black duck and gadwall.

4. Marsh and Water Birds

Twelve species of marsh and water birds were observed on the island at one time or another. Snowy and great egret, tricolored heron and glossy ibis are the most common species observed on the area.

5. Shorebirds, Gulls, Terns and Allied Species

Thirty species of shorebirds are known to occur on Wallops Island. Dunlin, sanderling, semipalmated sandpiper and red knot are the most abundant species followed by dowitchers, laughing and ring-billed gulls and semipalmated plover. Willets, piping plover and American oystercatcher nest on the island.

6. Raptors

Nine species of hawks and owls are known to be present on the island at different times of the year. American kestrel, osprey, turkey vulture and red-tailed hawk are the most often seen species on the area. Osprey are common nesters on Wallops Island, especially on NASA's towers and launch sites, to the dismay of NASA's launch site personnel.

7. Other Migratory Birds

Birds in this category are numerous; however, no surveys are conducted on these species.

8. Game Mammals

The Virginia white-tailed deer is found on both areas; however, no data are available on this species. NASA administers an annual hunting program on Wallops Island, but no harvest data are compiled.

10. Other Resident Wildlife

Species in this category include bobwhite quail, cottontail rabbit, mink, otter, raccoon and red fox. No data are available on these species.

H. PUBLIC USE

17. Law Enforcement

Wallops Island NWR is closed to all public admittance and with the need to have law enforcement available on Chincoteague NWR, the presence of officers on Wallops Island NWR is low. Several reports were received of trespass violations, but only one case was made for trespass. Waterfowl hunters in the area around the refuge were checked, and all were found to be in compliance.

J. OTHER ITEMS

4. Credits

The following individuals were involved in this report:

Section	Employee
Introduction	Schroer
B	Ailes
D	Schroer
E	Schroer & Ailes
F	Melvin
G	Ailes
H	Kessler

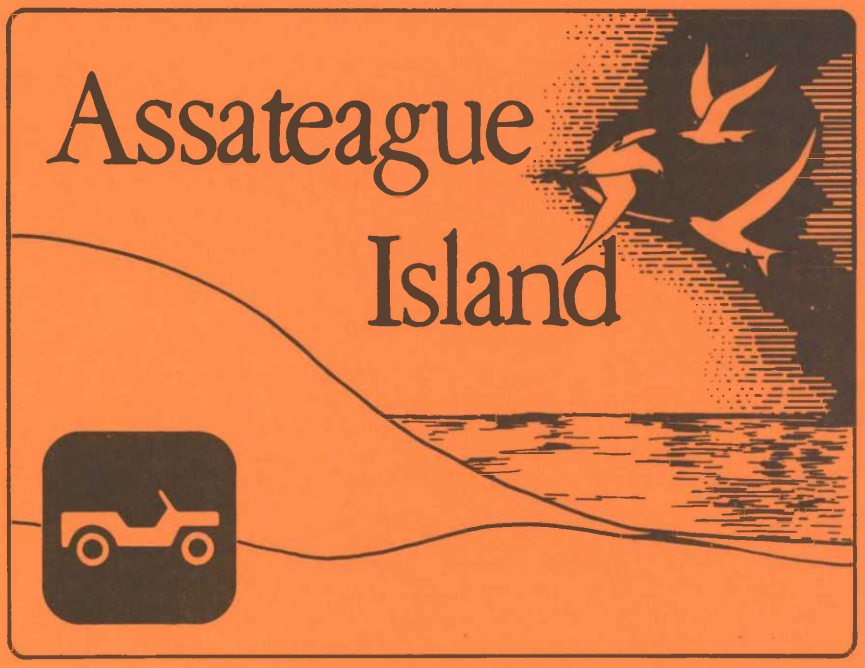
Typing was accomplished by Merritt with Wilson doing the proofreading.

K. FEEDBACK

After years of not being properly compensated, a step in the right direction was finally taken in recognizing the complexity of running the administrative functions of a National Wildlife Refuge. This step was in the form of changing the title of one position from Secretary, a title definitely not broad enough to cover the variety of jobs accomplished, to Office Assistant, a title that covers more territory but maybe not enough, and the same position was upgraded from a GS-5 to a GS-6, which was an improvement but still not enough when compared to the demands of the job. Over the years, refuge manager positions have been upgraded from being GS-9's and 11's to some that are now GM-14's, a result of the increasing complexity of the job. Clerical positions have also increased in complexity from the time the "clerk" would spend part of the day in the office and the rest in the field to the present day "clerks" who possess detailed knowledge of various administrative matters, such as accounting, procurement, property, personnel, etc. Unfortunately and unlike manager positions, "clerks" have not been given their fair recognition. The recent upgrades and change in titles is great but stopping short of making these positions professional ones would be a shame.

At the close of 1989, the prospects of resuming the master planning process for Chincoteague Refuge looked good. The process which was begun in 1984 came to a screeching halt in 1987 when local opposition developed, resulting in political involvement. The possible revitalization of the process is the result of the community leaders meeting with leaders of environmental/conservation groups, and a joint decision being made in favor of long range planning. The result was a joint letter being sent to Director Turner requesting that the process begin with total involvement by both sides. The refuge staff is optimistic about the prospects of long range planning in order to address the many issues that face this refuge; however, based on past complications, future attempts at master planning will need to proceed slowly and cautiously if a final product is to be realized. The local community is economically dependent on this refuge with the nearly 1.5 million annual visits. On the other hand, the refuge was listed by the Wilderness Society as one of the ten most endangered refuges in the nation, due to the volume of visitors and local pressures. With this in mind, master planning will be a challenge with many hurdles to jump and roadblocks to get around, any one of which could stop the process again.

Keeping up with needed maintenance, particularly large rehab projects, continues to be a problem and will continue to be one until a system is established for accomplishing recurring repairs on a regular recurring basis. Several systems have been tried over the years with little long term success. A case in point is the Beach Road on this station over which approximately 450,000 vehicles travel each year. This road has deteriorated to the point of being unsafe, and although the Regional Office sets this project at a very high priority, the funds provided seem to be diverted to other projects or reduced before the contract is awarded. Since this is not symptomatic of just the beach road project but of most large projects, a system to alleviate this problem would be to reserve a pool of funds, possibly at the Washington Office level, to take care of reductions in the budget or emergencies which seem to come up every year. Then once a project is funded, chances would be better that the project would be completed, and the Service would look more efficient in their planning efforts.



OFF-ROAD VEHICLES (ORV)

National Park Service
U.S. Fish & Wildlife Service

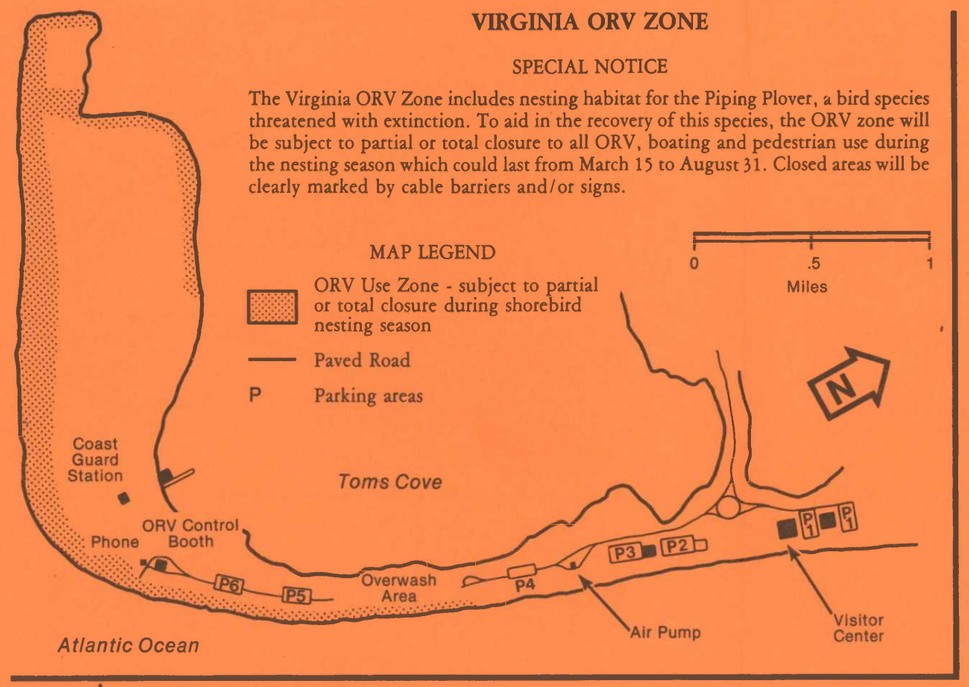
NATIONAL PARK SERVICE
Department of the Interior

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

VIRGINIA ORV ZONE

SPECIAL NOTICE

The Virginia ORV Zone includes nesting habitat for the Piping Plover, a bird species threatened with extinction. To aid in the recovery of this species, the ORV zone will be subject to partial or total closure to all ORV, boating and pedestrian use during the nesting season which could last from March 15 to August 31. Closed areas will be clearly marked by cable barriers and/or signs.



TAKE PRIDE IN ASSATEAGUE

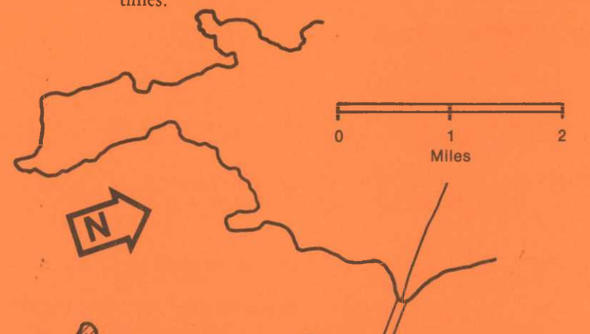
- Help keep the island free of litter.
- Help keep the island's plants and animals safe from harm.
- Enjoy yourself in a safe manner.
- Be considerate of the rights of other visitors.
- Abide by the laws and regulations that are in effect.

TIPS FOR ORV OPERATORS

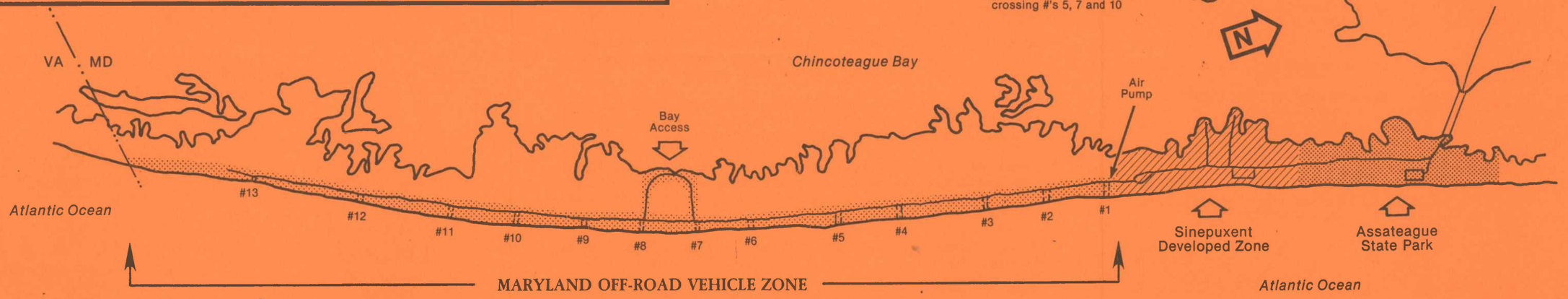
- Lower tire pressure to 15 pounds
- Carry four boards (2" × 6" × 36"L) for placement under each tire when stuck.
- After stopping vehicle, back up several feet before proceeding forward.
- Walk across suspected soft sand first to make sure it will hold your vehicle.
- Spinning your vehicle's tires only makes them dig deeper into the sand, increasing the chance that your vehicle's frame will bottom out.
- Driving in the tracks of another vehicle is easier than pushing through fresh sand. Keep front wheels straight and don't over-steer.
- Carry water displacement spray for drying wet engine electrical parts.
- Don't drive in salt water.
- Use CB channel 9 for emergencies.
- Remember: YOU ARE RESPONSIBLE FOR KNOWING THE REGULATIONS.

PETS IN THE ORV ZONE

Virginia Portion — Pets are prohibited.
Maryland Portion — Pets are permitted, but must be restrained by a leash no more than six feet in length, or otherwise physically confined at all times.



Emergency telephones are located near dune crossing #'s 5, 7 and 10



MARYLAND OFF-ROAD VEHICLE ZONE

Stay on Beach or Cabled Trail — Do NOT Ride on Dunes or on Vegetation

OVERSAND VEHICLE REGULATIONS AND CONDITIONS

Regulations prohibit operating motor vehicles outside established roads, parking areas, and designated off-road vehicle (ORV) areas. The following regulations apply to ORV use. They are designed to provide for enjoyment while protecting the fragile resources of this barrier island. Failure to comply with these terms may result in revocation of ORV permit and Federal prosecution.

ORV ZONE: ORV zones are shown on the enclosed maps. All sand dunes and vegetated areas are considered closed even though they may occur within a designated ORV zone.

ORV PERMITS: Permits are issued for an annual fee of $30. All vehicles using the ORV zone must display a valid permit on the driver's side of the front bumper. Any previous permit must be removed or covered by the new permit. The permit is issued to a specific vehicle in the name of the registered owner. Sale or transfer of the vehicle voids the permit. Replacement permits will be issued free if the permit holder presents a sufficient portion of the permit so that all numbers are readable.

In Virginia, permits may be obtained at the Seashore Visitor Center or the Refuge headquarters. In Maryland, permits may be obtained at the Ranger Station/ Campground Office. Permits may also be obtained by mail. Obtain an application and send with it a check made payable to National Park Service or U.S. Fish and Wildlife Service.

VEHICLE SPECIFICATIONS:

Number of wheels	4
Maximum vehicle length	26 feet
Maximum vehicle width	8 feet
Minimum vehicle ground clearance	7 inches
Gross vehicle weight rating may not exceed	10,000 pounds

In addition, all two-wheel-drive ORV's must have a minimum of 8″ of tread width in contact with the surface. Tires with regular mud-snow grip tread are not acceptable.

REQUIRED EQUIPMENT: ORV operators in designated zone must carry and be able to display upon request:

1. A shovel with a blade at least 6″ square and a handle at least 18″ long.
2. A vehicle jack sufficient to lift one wheel clear of the sand.
3. A jack support at least 12″ × 12″ of non-bending steel, 5/8″ plywood, or 1½″ hardwood.
4. A tire gauge with a minimum reading of 15 pounds or less.
5. A tow rope or tow strap, chain, or cable with a minimum pulling strength of 6,000 pounds and at least 10 feet long. Ropes must be a minimum of 3/4″ in diameter. Nylon or dacron ropes at 1/2″ in diameter and 1/4″ carbon steel cable are acceptable. Chain links must be a minimum of 5/16″ in diameter.

ORV USE LIMITS: Purchase of the permit does not guarantee access to ORV zones. Access may be reduced or curtailed due to vehicle density limits, emergency conditions, or management constraints. ORV use limits: MARYLAND — 145; VIRGINIA — 48 (18 when hook area is closed due to nesting). When these limits are reached, vehicle access is managed on a one-off-one-on basis.

VEHICLE OPERATION: Vehicle speed in ORV zones may not exceed 25 miles per hour, which must be reduced to 15 miles per hour when within 100 feet of pedestrians or people on horseback. Driving so as to cut circles or needlessly defacing the beach is prohibited. Driving on sand dunes or vegetated areas is prohibited.

RIGHT-OF-WAY: When two vehicles approach in the same track, both operators must slow and the operator with the ocean on his right shall yield the right-of-way. Pedestrians and people on horseback have the right-of-way.

PASSENGER SAFETY: Passengers shall not ride on the fenders, hood, roof, sides, tailgate, or in any other position outside of a moving vehicle. No vehicle shall be used to tow a person or any recreational device over land, over water, or in the air. WEAR YOUR SEAT BELTS!

LICENSES: All ORV's must bear valid State license plates and be properly registered to operate over public highways. ORV operators must possess a valid State driver's license.

OTHER REGULATIONS: All other applicable State and Federal laws are enforced. YOU ARE RESPONSIBLE FOR KNOWING THE REGULATIONS. When in doubt, check with uniformed Seashore or Refuge personnel.

INSPECTION OF VEHICLE: Authorized personnel may inspect ORV's at any time to insure compliance with licensing, registration, permits, vehicle specifications, and equipment requirements.

OVERNIGHT PARKING IN VIRGINIA: Chincoteague National Wildlife Refuge is closed to parking, entry, and use as follows: April 1–October 31, 10 p.m.–5 a.m.; November 1–March 31, 6 p.m.–6 a.m. Only those with valid overnight fishing permits may remain in the area during these hours.

OVERNIGHT PARKING IN MARYLAND: Overnight parking on the beach is permitted only for those who are actively engaged in fishing. Self-contained vehicles (except travel trailers) are allowed to park overnight in the "Bull Pen" parking area if they are equipped with a toilet and permanently installed waste storage tank capable of holding 2 days volume of material for all occupants.

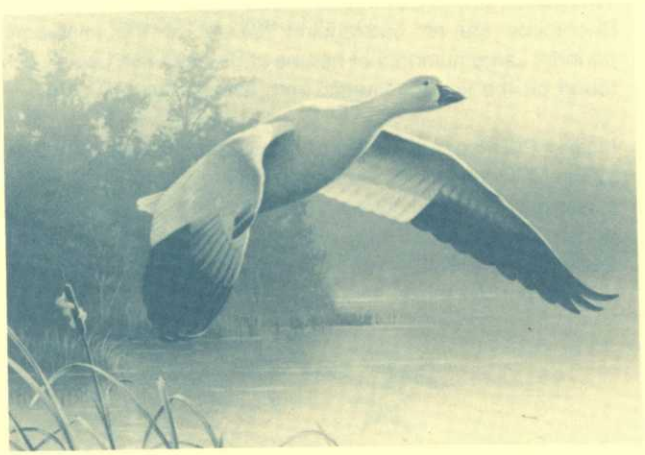
TOWED TRAILERS: Travel trailers are prohibited in the ORV zone. Other types of trailers are discouraged and may be prohibited at certain times of the year because they tend to get stuck in soft sand and interfere with other traffic.

SANITATION: Litter or wastes of any sort must be disposed of at established collection stations or removed from the area. Such materials may not be buried. Self-contained vehicles must use a designated sanitary dump station. Liquid waste, such as dishwater or sink drainage, must be deposited in a holding tank.

Assateague Island National Seashore
National Park Service
Route 2, Box 294
Berlin, MD 21811
(301) 641-3030; 641-1441

Chincoteague National Wildlife Refuge
U.S. Fish & Wildlife Service
P.O. Box 62
Chincoteague, VA 23336
(804) 336-6122

Birds



Chincoteague
National
Wildlife
Refuge

Virginia

The topography of Chincoteague National Wildlife Refuge consists of wide sandy beach backed by a series of low dunes which fall away to extensive salt marshes bordering Chincoteague Bay. Some parts of the refuge, particularly the southern end, also contain extensive areas of pine and oak interspersed with ponds and potholes. Several shallow freshwater impoundments were developed to make the refuge more attractive to waterfowl.

Thousands of brant, geese, and ducks winter on the refuge. Shorebirds are an outstanding feature of the migration periods. Large numbers of herons and egrets can usually be found on the impoundments from mid-spring to late fall.

Most of the Maryland portion of Assateague Island is managed by the National Park Service whose policies emphasize maintaining natural habitat communities. Birds found on the Virginia portion of the island may also be observed in Maryland. Because of the freshwater impoundments, however, the Virginia portion tends to attract larger numbers of birds.

This folder lists over 296 birds that have been identified on the refuge, and is in accordance with the Sixth American Ornithologists' Union Checklist.

Most birds are migratory, therefore their seasonal occurrence is coded as follows:

SEASON

s -	Spring	March - May
S -	Summer	June - August
F -	Fall	September - November
W -	Winter	December - February

† - Nesting has occured on the refuge within the past 5 years.
* - A species which occurs and/or nests in only one or two locations in the refuge.

RELATIVE ABUNDANCE

a - abundant	a species which is very numerous
c - common	certain to be seen or heard in suitable habitat
u - uncommon	present, but not certain to be seen
o - occasional	seen only a few times during a season
r - rare	seen at intervals of 2 to 5 years

		s	S	F	W
LOONS - GREBES					
____	Red-throated Loon	u		u	u
____	Common Loon	c	r	c	c
____	Pied-billed Grebe †	c	u	c	c
____	Horned Grebe	c		c	c
____	Red-necked Grebe	r		r	r
____	Eared Grebe			r	
SHEARWATERS - STORM PETRELS					
____	Greater Shearwater	r			
____	Sooty Shearwater	r			
____	Wilson's Storm-Petrel	r			
GANNET - PELICANS - CORMORANTS					
____	Northern Gannet	u		u	u
____	American White Pelican	o		o	o
____	Brown Pelican	u	c	u	
____	Great Cormorant	r		r	r
____	Double-crested Cormorant	c	u	a	c
BITTERNS - HERONS - IBISES					
____	American Bittern	o		o	o
____	Least Bittern †	r	r	r	
____	Great Blue Heron	c	u	c	c
____	Great Egret †	c	a	c	u
____	Snowy Egret †	c	a	a	o
____	Little Blue Heron †	c	c	c	o
____	Tricolored Heron †	u	c	c	
____	Cattle Egret †	u	c	c	
____	Green-backed Heron †	u	u	u	
____	Black-crowned Night-Heron †	u	c	u	u
____	Yellow-crowned Night-Heron †	o	o	o	
____	White Ibis	r	r	r	
____	Glossy Ibis †	c	a	c	r
SWANS - GEESE - DUCKS					
____	Fulvous Whistling-Duck	r	r	r	r
____	Tundra Swan	c	r	c	c
____	Mute Swan †	c	c	c	c
____	Greater White-fronted Goose				r
____	Snow Goose	c	r	a	c
____	Brant	c	r	c	c
____	Canada Goose †	a	c	a	c
____	Wood Duck †	u	u	c	r
____	Green-winged Teal	c	r	c	c
____	American Black Duck †	c	c	c	c
____	Mallard †	c	u	c	c
____	Northern Pintail	c	r	c	c
____	Blue-winged Teal †	c	u	c	r

		s	S	F	W
____	Northern Shoveler	c	o	c	c
____	Gadwall †	c	c	c	c
____	Eurasian Wigeon			r	r
____	American Wigeon	c	r	c	c
____	Canvasback	r		o	o
____	Redhead	o		o	o
____	Ring-necked Duck	o		u	u
____	Greater Scaup	u		u	u
____	Lesser Scaup	u		u	u
____	Common Eider			r	r
____	Oldsquaw	c		u	c
____	Black Scoter	c	r	c	c
____	Surf Scoter	c	r	c	c
____	White-winged Scoter	c	r	c	c
____	Common Goldeneye	u		u	u
____	Bufflehead	c	r	c	c
____	Hooded Merganser	u		u	u
____	Common Merganser			u	u
____	Red-breasted Merganser	c	r	c	c
____	Ruddy Duck	c	o	c	c
VULTURES - HAWKS - FALCONS					
____	Turkey Vulture	o	o	o	o
____	Osprey †	c	c	c	
____	Bald Eagle	o		o	o
____	Northern Harrier †	c	o	c	c
____	Sharp-shinned Hawk	u		c	u
____	Cooper's Hawk	u		u	u
____	Red-shouldered Hawk	o		o	o
____	Red-tailed Hawk †	u	o	u	u
____	Rough-legged Hawk				r
____	American Kestrel	o	r	u	o
____	Merlin	o		u	o
____	Peregrine Falcon †	u	u	u	u
QUAIL - RAILS - COOT					
____	Northern Bobwhite †	a	a	a	a
____	Yellow Rail			r	
____	Black Rail †	r	r	r	
____	Clapper Rail †	c	c	c	u
____	King Rail †	u	o	u	o
____	Virginia Rail †	u	u	u	u
____	Sora	u		u	
____	Purple Gallinule		r	r	
____	Common Moorhen †	r	o	o	
____	American Coot	u	r	c	u

		s	S	F	W
PLOVERS - SANDPIPERS					
____	Black-bellied Plover	c	c	c	u
____	Lesser Golden-Plover	r	o	u	
____	Wilson's Plover †	u	u		
____	Semipalmated Plover	a	a	c	
____	Piping Plover †	u	u	u	
____	Killdeer †	o	u	u	o
____	American Oystercatcher †	c	c	c	c
____	Black-necked Stilt	r	r	r	
____	American Avocet	o	o	u	r
____	Greater Yellowlegs	u	c	c	u
____	Lesser Yellowlegs	u	c	c	o
____	Solitary Sandpiper	o	o	o	
____	Willet †	c	c	u	r
____	Spotted Sandpiper	u	u	u	r
____	Upland Sandpiper		r	r	
____	Whimbrel	c	c	u	r
____	Hudsonian Godwit		u	o	
____	Marbled Godwit	r	u	o	
____	Ruddy Turnstone	a	c	c	u
____	Red Knot	c	c	u	r
____	Sanderling	a	a	c	c
____	Semipalmated Sandpiper	a	a	c	
____	Western Sandpiper	r	c	c	o
____	Least Sandpiper	a	c	c	o
____	White-rumped Sandpiper	c	u	u	
____	Baird's Sandpiper	r	r	o	
____	Pectoral Sandpiper	r	c	c	r
____	Dunlin	a	o	a	a
____	Curlew Sandpiper	r	r	r	
____	Stilt Sandpiper	o	c	c	
____	Buff-breasted Sandpiper		o	u	
____	Ruff	r	r	r	
____	Short-billed Dowitcher	a	a	c	o
____	Long-billed Dowitcher	u	r	u	o
____	Common Snipe	u	r	u	u
____	American Woodcock †	u	u	u	o
____	Wilson's Phalarope	r	r	r	
____	Red-necked Phalarope	o	r	r	
JAEGERS - GULLS - TERNS - AUKS					
____	Pomarine Jaegar			r	
____	Parasitic Jaegar			r	
____	Laughing Gull †	a	a	a	r
____	Little Gull	r		r	
____	Common Black-headed Gull	r		r	

		s	S	F	W
____	Bonaparte's Gull	u		o	u
____	Ring-billed Gull	a	c	a	a
____	Herring Gull †	c	c	a	a
____	Iceland Gull	o			o
____	Lesser Black-backed Gull			o	
____	Glaucous Gull	r			
____	Great Black-backed Gull	c	c	c	c
____	Gull-billed Tern †	u	u	o	
____	Caspian Tern	o	c	c	
____	Royal Tern †	c	c	c	r
____	Sandwich Tern	r	u	o	
____	Roseate Tern		r		
____	Common Tern †	c	c	c	o
____	Forster's Tern †	c	c	c	r
____	Least Tern †	c	c		
____	Black Tern	r	c	o	
____	Black Skimmer †	u	c	c	r
DOVES - CUCKOOS - OWLS - SWIFTS - HUMMINGBIRD					
____	Rock Dove	u	u	u	u
____	Mourning Dove †	c	c	c	c
____	Black-billed Cuckoo †	o	r	o	
____	Yellow-billed Cuckoo †	c	c	c	r
____	Common Barn-Owl †	o	o	o	o
____	Eastern Screech-Owl †	c	c	c	c
____	Great Horned Owl †	c	c	c	c
____	Snowy Owl				r
____	Long-eared Owl				r
____	Short-eared Owl			o	o
____	Common Nighthawk †	u	c	u	
____	Chuck-will's-widow †	c	c		
____	Chimney Swift †	c	c	c	
____	Ruby-throated Hummingbird †	u	u	u	
____	Belted Kingfisher	u	o	c	u
WOODPECKERS - FLYCATCHERS					
____	Red-headed Woodpecker	o	o	o	
____	Red-bellied Woodpecker	o	o	u	u
____	Yellow-bellied Sapsucker	o		o	
____	Downy Woodpecker †	u	u	u	u
____	Hairy Woodpecker	o		o	o
____	Northern Flicker †	c	c	a	c
____	Olive-sided Flycatcher	r			
____	Eastern Wood-Pewee †	c	c	c	
____	Acadian Flycatcher	u			
____	Willow Flycatcher		r		

		s	S	F	W
___	Least Flycatcher	r			r
___	Eastern Phoebe †	u	u	c	o
___	Great Crested Flycatcher †	c	c	c	
___	Western Kingbird				r
___	Eastern Kingbird †	a	a	c	
LARKS - SWALLOWS - JAYS - CROWS					
___	Horned Lark †	c	c	c	c
___	Purple Martin †	c	c		
___	Tree Swallow †	a	c	a	o
___	Northern Rough-winged Swallow		r		
___	Bank Swallow	r	o	r	
___	Cliff Swallow			r	
___	Barn Swallow †	a	a	a	
___	Blue Jay	o	o	o	o
___	American Crow †	c	c	c	c
___	Fish Crow †	c	c	c	c
TITMICE - NUTHATCHES - WRENS					
___	Carolina Chickadee	o	o	o	o
___	Tufted Titmouse			r	
___	Red-breasted Nuthatch	o		o	o
___	White-breasted Nuthatch			r	r
___	Brown-headed Nuthatch †	u	u	u	u
___	Brown Creeper			u	u
___	Carolina Wren †	c	c	c	c
___	House Wren †	c	c	c	r
___	Winter Wren	u		c	u
___	Sedge Wren	o		u	u
___	Marsh Wren †	u	u	u	
KINGLETS - THRUSHES - THRASHERS					
___	Golden-crowned Kinglet	c	r	c	c
___	Ruby-crowned Kinglet	c	r	c	c
___	Blue-gray Gnatcatcher †	c	c	c	
___	Eastern Bluebird †	r	r	r	r
___	Veery	r		u	
___	Gray-cheeked Thrush	o		c	
___	Swainson's Thrush			c	
___	Hermit Thrush	u		c	c
___	Wood Thrush	u	o	u	
___	American Robin †	c	c	a	u
___	Gray Catbird †	c	c	c	u
___	Northern Mockingbird †	u	u	u	o
___	Brown Thrasher †	c	c	c	u
WAXWINGS - SHRIKES - STARLING					
___	Water Pipit	o		o	o
___	Cedar Waxwing	u	o	c	u

		s	S	F	W
___	European Starling †	c	c	a	a
VIREOS - WOOD WARBLERS					
___	White-eyed Vireo †	c	c	c	
___	Solitary Vireo	r		r	
___	Yellow-throated Vireo	r			
___	Warbling Vireo	r			
___	Philadelphia Vireo	r			
___	Red-eyed Vireo †	c	c	c	
___	Blue-winged Warbler	r		r	
___	Golden-winged Warbler	r		r	
___	Tennessee Warbler			r	
___	Orange-crowned Warbler			r	r
___	Nashville Warbler			r	
___	Northern Parula	o		o	
___	Yellow Warbler	c	c	r	
___	Chestnut-sided Warbler	r		r	
___	Magnolia Warbler	r		c	
___	Cape May Warbler			c	
___	Black-throated Blue Warbler	o		c	
___	Yellow-rumped Warbler	a	r	a	a
___	Black-throated Green Warbler			r	
___	Blackburnian Warbler	r	r	r	
___	Pine Warbler †	a	a	a	o
___	Prairie Warbler †	a	a	a	
___	Palm Warbler	o		a	o
___	Bay-breasted Warbler	r		r	
___	Blackpoll Warbler	u		u	
___	Cerulean Warbler	r		r	
___	Black-and-white Warbler †	u	u	c	
___	American Redstart	u	a	a	
___	Prothonotary Warbler		r		
___	Worm-eating Warbler	r		r	
___	Swainson's Warbler	r		r	
___	Ovenbird	u		c	
___	Northern Waterthrush	u	c	c	
___	Louisianna Waterthrush	r		r	
___	Kentucky Warbler	r	r		
___	Connecticut Warbler	r		r	
___	Common Yellowthroat †	a	a	a	u
___	Wilson's Warbler				o
___	Canada Warbler	r	r	r	
___	Yellow-breasted Chat †	u	u	o	r
TANAGERS - SPARROWS					
___	Summer Tanager †	o	o	r	
___	Scarlet Tanager	o		u	

		s	S	F	W
___	Northern Cardinal †	c	c	c	c
___	Rose-breasted Grosbeak	u		u	
___	Blue Grosbeak †	u	o	o	
___	Indigo Bunting	u	u	u	
___	Dickcissel			r	r
___	Rufous-sided Towhee †	c	c	c	c
___	American Tree Sparrow				o
___	Chipping Sparrow †	c	o	c	
___	Clay-colored Sparrow			r	
___	Field Sparrow †	c	c	c	o
___	Vesper Sparrow			o	u
___	Lark Sparrow			r	r
___	Savannah Sparrow	c	u	c	c
___	Grasshopper Sparrow			r	
___	Henslow's Sparrow	r		r	
___	Sharp-tailed Sparrow †	o	u	u	u
___	Seaside Sparrow †	c	c	c	o
___	Fox Sparrow	u		u	u
___	Song Sparrow †	c	c	c	c
___	Lincoln's Sparrow	r		r	
___	Swamp Sparrow	c	r	c	c
___	White-throated Sparrow	c		c	c
___	White-crowned Sparrow	r	o	o	o
___	Dark-eyed Junco	u		c	u
___	Lapland Longspur				o
___	Snow Bunting	o		u	u
BLACKBIRDS - FINCHES					
___	Bobolink	o		u	
___	Red-winged Blackbird †	a	a	a	a
___	Eastern Meadowlark †	c	c	c	c
___	Yellow-headed Blackbird	r		r	
___	Rusty Blackbird			o	o
___	Boat-tailed Grackle †	c	c	c	c
___	Common Grackle †	c	c	c	c
___	Brown-headed Cowbird †	c	c	c	u
___	Orchard Oriole †	o	o	o	
___	Northern Oriole	o	o	c	
___	Purple Finch	r		o	
___	House Finch	r		r	
___	Red Crossbill	r			r
___	Common Redpoll	r			r
___	Pine Siskin	o		o	o
___	American Goldfinch †	c	c	c	c
___	Evening Grosbeak	r			r
___	House Sparrow †	r	r	r	r

ACCIDENTAL SPECIES

These additional 19 species have been seen only once or twice on the refuge:

White-faced Ibis
Dovekie
Atlantic Puffin
Gray Kingbird
Black Vulture
Broad-winged Hawk
Swainson's Hawk
Mountain Plover
Northern Shrike
Chestnut-collared Longspur
Sharp-tailed Sandpiper
Long-tailed Jaegar
Elegant Tern
Common Ground Dove
Ash-throated Flycatcher
Northern Wheatear
Black-headed Grosbeak
Le Conte's Sparrow
Hooded Warbler

U.S. FISH AND WILDLIFE SERVICE

Chincoteague is one of more than 430 refuges in the National Wildlife Refuge System administered by the U.S. Fish and Wildlife Service. The National Wildlife Refuge System is a network of lands and waters managed specifically for the protection of wildlife and wildlife habitat and represents the most comprehensive wildlife resource management program in the world. Units of the system stretch across the United States from northern Alaska to the Florida Keys, and include small islands in the Caribbean and South Pacific. The character of the refuges is as diverse as the nation itself.

The Service also manages National Fish Hatcheries, and provides Federal leadership in habitat protection, fish and wildlife research, technical assistance and the conservation and protection of migratory birds, certain marine mammals and threatened and endangered species.

For further information or to report unusual sightings, please contact:

Refuge Manager
Chincoteague National Wildlife Refuge
P.O. Box 62
Chincoteague, Virginia 23336
Telephone: (804) 336-6122

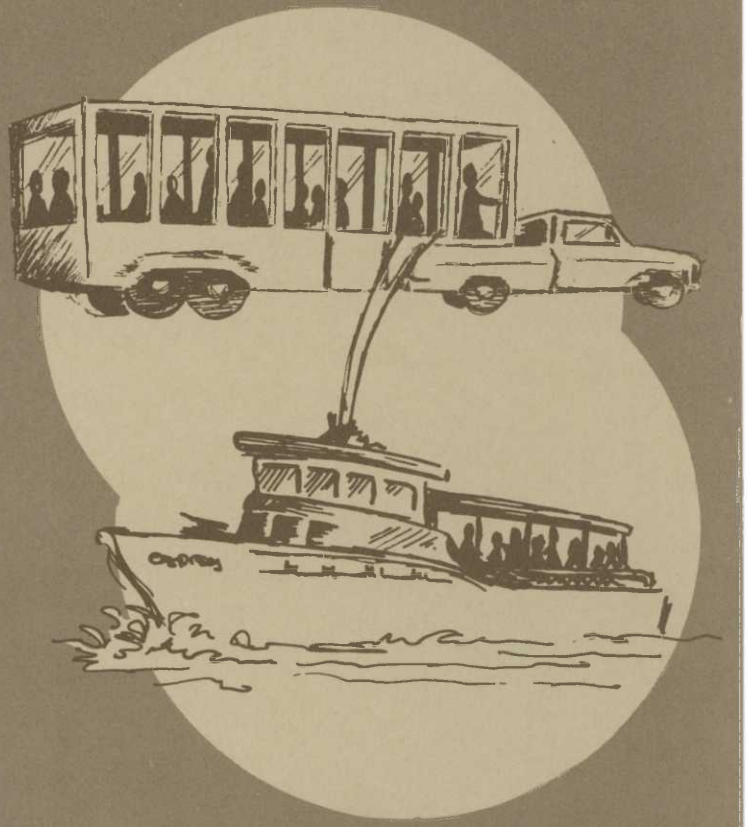
UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

RL-51570-2 September 1988

WILDLIFE TOURS

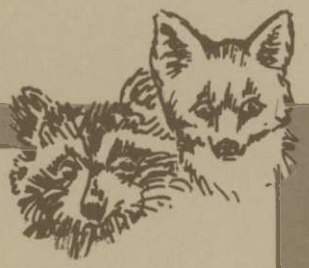
CHINCOTEAGUE ISLAND, VIRGINIA

ISLAND CRUISE
LAND SAFARI
FISHING



A VISITOR'S SERVICE
OF THE CHINCOTEAGUE NATIONAL
WILDLIFE REFUGE

WILDLIFE TOURS



EVENING CRUISE

Relax and enjoy the fully narrated, guided tour through the scenic Assateague Channel. You will be traveling on the comfortable cruise ship "Osprey". A great way to relax, unwind, and enjoy nature's 'back yard'.

Duration: 1 hour, 30 minutes.

July, 5 & 7 pm daily
August, 4:30 & 6:30 daily
Spring & Fall schedule varies.

WILDLIFE SAFARI

A fully narrated tour through the 'back roads' of the refuge. Not only is this tour very informative, but it is also very exciting for both the young and old. Truly an unforgettable time.

Duration: 1 hour, 30 minutes.

July/August, 10 am daily.
Spring & Fall schedule varies.

FAMILY FISHING

Enjoy a day bottom fishing on the calm, serene waters of the Assateague Channel or Chincoteague Inlet.

Bait and ice are provided. Fishing tackle may be rented on board.

Duration: 7 hours.

July - August
Tuesday/Thursday
7:00 am

GROUP TOURS

To take full advantage of the beautiful and unique sights the Chincoteague National Wildlife Refuge has to offer, we would be happy to have one of our experienced tour guides meet your group and escort you through the Refuge.

Tour guides will also be available in case you decide to plan a tour after your groups' arrival at the Refuge. Arrangements prior to arrival, such as Reservations, can be made by writing to Island Cruises, P. O. Box 83, Chincoteague, Virginia 23336.

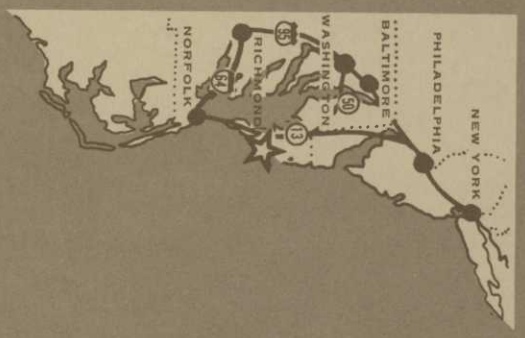
All schedules are subject to change.
Extra tours scheduled according to demand.

For information call
804-336-5593 or 804-336-5511

Reservations can be made at the Fish & Wildlife Refuge Visitor Center or The Refuge Motor Inn.

WILDLIFE TOURS

CHINCOTEAGUE ISLAND, VIRGINIA

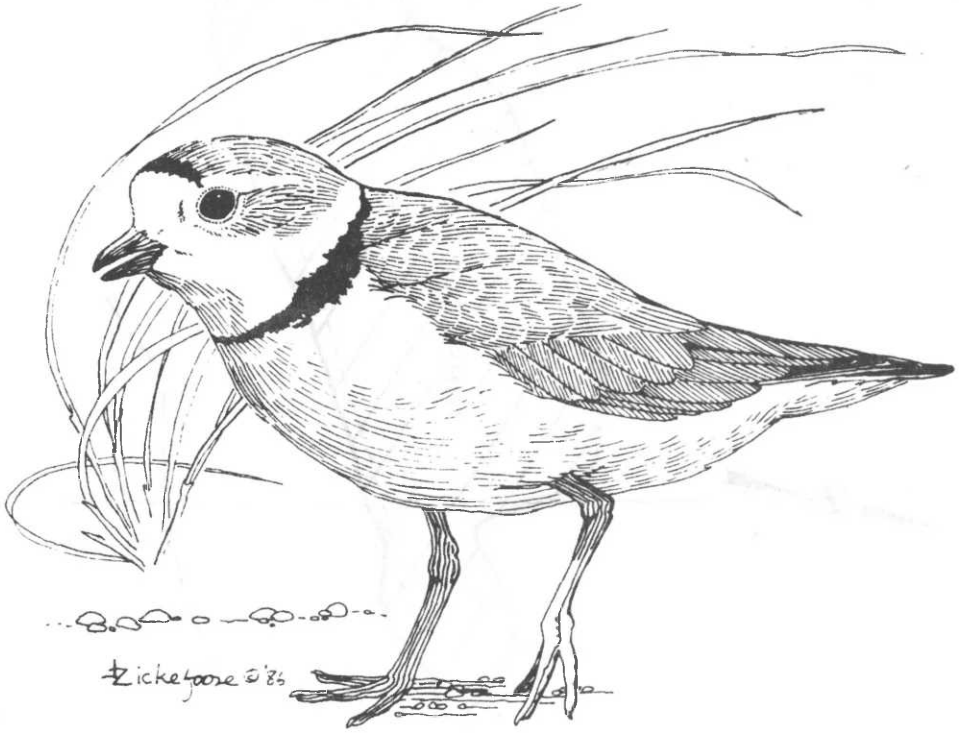


ISLAND CRUISES INC.
P. O. BOX 83
CHINCOTEAGUE, VA. 23336

Protecting The PIPING PLOVER

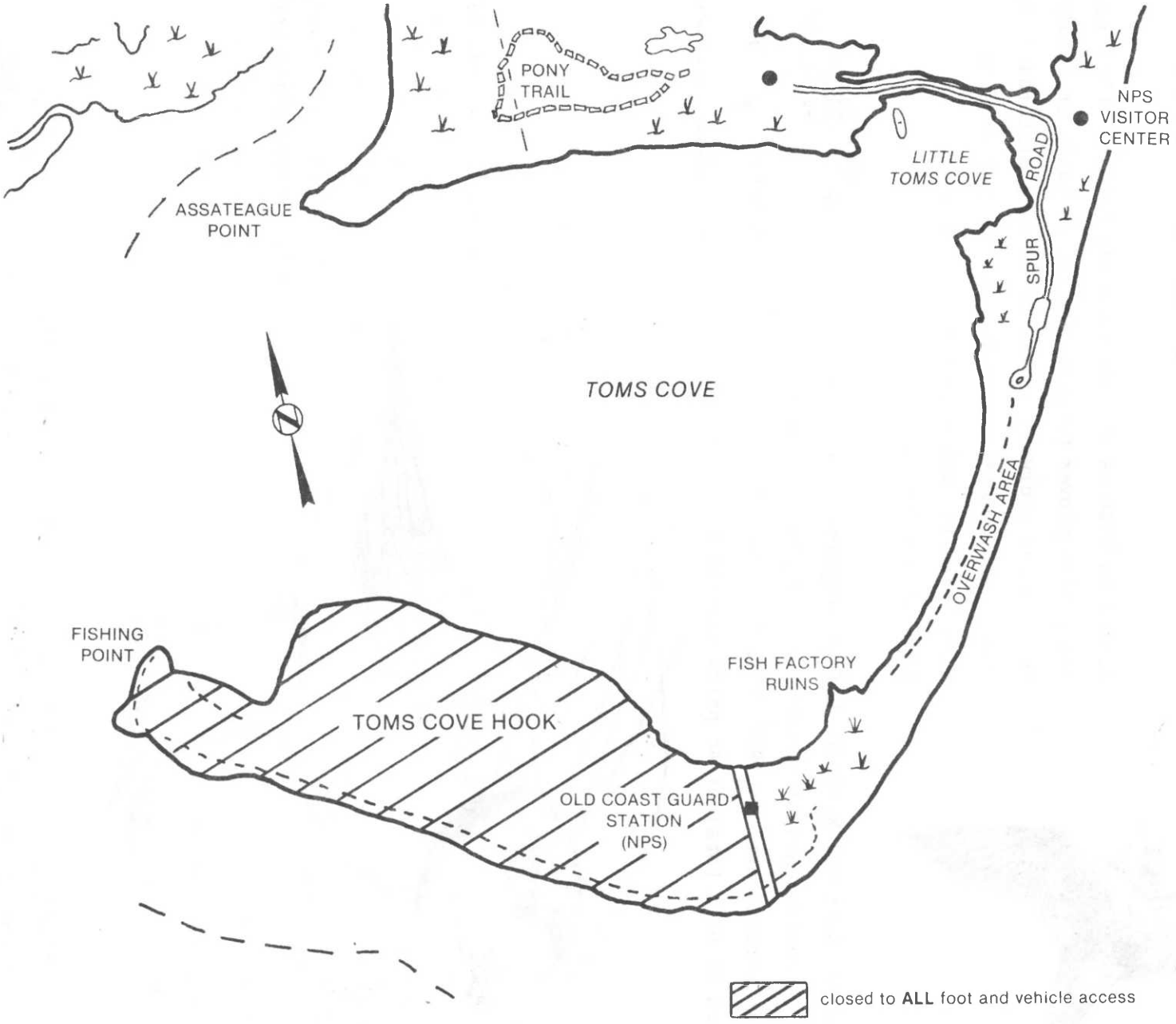
Listed in 1986 as threatened along the Atlantic Coast, the piping plover prefers nesting on sandy or cobbly beaches and overwash areas. Predation, disturbance by humans and domestic animals, and habitat loss are considered the major factors contributing to the populations decline.

Chincoteague National Wildlife Refuge supports one of the largest concentrations of breeding piping plovers along the entire Atlantic Coast. In 1987, Toms Cove Hook alone supported 16 of a total of 46 pairs nesting on the refuge.



Successful recovery of the piping plover depends largely on increasing the reproductive success of nesting pairs. However, to date, reproduction still remains very low particularly on Toms Cove Hook.

To actively protect and increase efforts to restore the threatened piping plover on Chincoteague National Wildlife Refuge, the refuge will close Toms Cove Hook to all public access between March 15 and August 31. Elimination of human disturbance, as well as stepped up efforts to control predation, should provide the piping plover the degree of protection needed for recovery.


PONY
TRAIL
NPS
VISITOR
CENTER
LITTLE
TOMS COVE
ROAD
SPUR
ASSATEAGUE
POINT
TOMS COVE
OVERWASH AREA
FISHING
POINT
FISH FACTORY
RUINS
TOMS COVE HOOK
OLD COAST GUARD
STATION
(NPS)
closed to **ALL** foot and vehicle access

Chincoteague

Chincoteague National Wildlife Refuge
Virginia

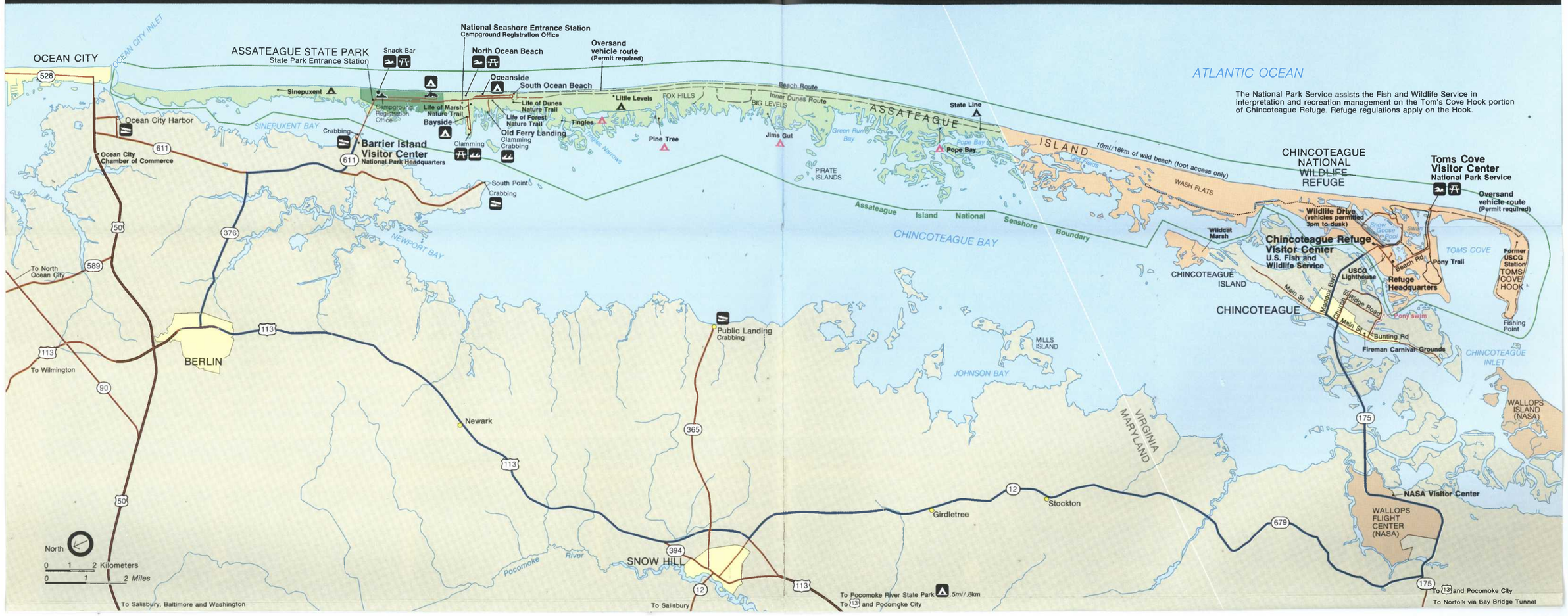
Fish and Wildlife Service
U.S. Department of the Interior

Map and Guide

Lifeguards and Swimming Safety

National Park Service Lifeguards supervise the North Beach and Toms Cove area beaches nearest the bathhouses in summer only. The state park also has summer lifeguard operations. Mats and floats, except U.S.C.G.-approved personal flotation devices, are prohibited at lifeguarded beaches. Elsewhere they should be used only by expert swimmers. Mats and floats provide a false sense of security to the poor swimmer, and seashore drownings have been related to these devices. They can deflate, or the occupant can be knocked off by a wave. See the bathhouse exhibits for important information on the purpose of the lifeguard flags and the dangers of stinging marine organisms, heavy surf, or seaward currents.

TAKE PRIDE IN AMERICA



Facilities at Lifeguarded Beaches

Maryland end/Sinepuxent area. Next to the day-use parking lot is a bathhouse with rinse-off showers, changing stalls, toilet facilities, and drinking water. The boardwalk from the parking lot to a dune overlooking the beach is traversable by wheelchair. The state park also has a picnic area and bathhouse facilities. During the summer, a state park concessioner sells food and drink. **Virginia end/Toms Cove area.** Near main parking lots are bathhouses with rinse-off showers, changing stalls, toilet facilities, and drinking water. No food or drink is sold at this end of the island. Wheelchair access is available to all facilities and the lifeguarded beach.

The 50-mile distance between the north and south ends of the island takes about 1¼ hours to drive. We recommend the route shown in blue on the map.

Recommended travel route
Oversand vehicle route (permit required)
Hiking trail
Hiker/Biker trail
Public campground
Campsite: backpack in only
Campsite: backpack or canoe in
Picnic area
Boat launch
Lifeguarded beach

Enjoying the Seashore World

Surf Fishing

Ask at a visitor center for fishing information and regulations. Naturalists present surf fishing demonstrations in summer for anglers new to ocean fishing. No saltwater license is required for surf fishing along this coast. Fishing is prohibited on lifeguarded beaches or in designated surfing zones. On the island's Virginia end an overnight fishing permit is required between 10 p.m. and sunrise; ask at the Toms Cove or Chincoteague Refuge Visitor Centers.

Oversand Vehicle Use

Off-road vehicle (ORV) zones are posted and maps are available at national seashore and refuge headquarters. ORVs must stay on marked oversand vehicle routes. **All sand dunes and vegetated areas are closed, even those within a designated ORV zone.** Vehicles in ORV zones must properly display a valid permit. ORV permits are issued at the national seashore or refuge during normal business hours. Permits may also be obtained by mail. A fee is charged for all permits. Vehicle specification and equipment requirements for ORVs are strictly enforced. Limits are placed on the number of vehicles allowed on the beach at any one time. Write to the national seashore or wildlife refuge for information and requirements before bringing an ORV here for use.

Clamming, Crabbing, and Shell Collecting

Clamming is best at the island's Maryland end. The favored method here is raking while wading in the generally shallow bay, but use caution for deep water. Crabbers in Maryland or Virginia commonly use a crab net and baited line. Crabs must measure 5 inches from point to point in Maryland. As a conservation measure we recommend the same size in Virginia. Few wild oysters are found around Assateague, and you may not trespass on leased oyster beds. Ask at visitor centers for information on shellfishing and best locations. Assateague is not generally known for good shell collecting. The most productive beaches are on the southern tip of Toms Cove Hook in Virginia, or at the extreme northern end in Maryland. Shells may not be sold or otherwise used for commercial purposes. Limit collections to those shells you can carry in a one-gallon container on any one visit.

Canoeing and Boating

Chincoteague Bay waters are ideal for canoeing at the Maryland end. Four canoe-in campsites are located there (see Backcountry Camping). Use the canoe launch at the end of Ferry Landing Road. Be aware of wind forecasts and get off the water during thunderstorms. Each occupant must have a personal flotation device. Canoe rentals are several miles away and you must haul them to launch sites. Rent boats with motors in Chincoteague or Ocean City. Chincoteague Island has a boat ramp for public use. Large boats at the island's Maryland end should use West Ocean City or state park launch facilities on the mainland. The bay is generally shallow; boat operators should watch for sandbars. **Wildlife refuge regulations prohibit landing a boat anywhere on the island's Virginia end** other than at Fishing Point. Boats and flotation devices of any kind are prohibited in pools on the wildlife refuge.

Hiking and Bicycling

Hiking. At the island's **Maryland end,** short, self-guiding walks are available on the Life of the Marsh, Life of the Forest, and Life of the Dunes nature trails. You can take longer hikes north to Ocean City Inlet or south on the ORV inner-dune road. At the **Virginia end,** you can hike the refuge's Wildlife Drive, which is reserved for hikers and bicyclists until 3 p.m. each day. The Pony Trail is usually a good place to see ponies. Beach hikers can enjoy miles of undisturbed beach north of the Toms Cove Visitor Center.

Bicycling. In Virginia, a bike path leads from the town of Chincoteague to the Chincoteague Refuge Visitor Center, circles Wildlife Drive, and continues to the National Park Service's Toms Cove Visitor Center. The Pony Trail is also open for bikes. On summer weekends all parking areas along the ocean here may be filled, so bicycling makes extra good sense then. Biking not only helps you avoid parking problems, but also helps alleviate them. **In Maryland,** cyclists can use 3 miles of bike path along Bayberry Drive and Oceanside Campground. Caution should be used on the two-lane Bayside Drive and Old Ferry Landing Road.

Safety, Regulations, Pets, and Hunting

Safety concerns are described under specific topics in this folder. Read these entries carefully. General safety and management regulations follow:

Water Safety and Seashore Hazards. Use the lifeguarded beaches. Mats and tubes are prohibited on lifeguarded beaches and discouraged elsewhere (see Lifeguards and Swimming Safety). Treat breaking surf waves with respect; dislocated shoulders and sand abrasions are not uncommon. **EVEN BROKEN NECKS AND PARALYSIS HAVE RESULTED FROM RIDING THE WAVES IN SOME FASHION AND BEING THROWN INTO THE SAND HEAD FIRST.** Get off the beach during lightning storms. Overexposure to sun causes heat exhaustion and/or severe sunburn. Barefeet can be hurt by shells, glass, or hot coals left in the sand. Do not approach ponies closely. They can bite and kick, inflicting severe injuries.

Driving and Parking. Drive very slowly! Campgrounds, parking lots, and popular crabbing areas are crowded with backing cars, bicycles, and children darting between parked vehicles. Follow at a safe distance. Do not stop your car suddenly or block traffic to watch ponies. Park only in designated areas, whether at campgrounds, developed beaches, or other areas. In Virginia, demand often exceeds available parking space on summer weekends.

Hours of Operation. The wildlife refuge in Virginia closes from 10 p.m. to 5 a.m. March 15 through October and from 6 p.m. to 6 a.m. the rest of the year. Overnight surf fishing is allowed; a special permit is required (see "Surf Fishing"). There is no closing time in Maryland but overnight stays are permitted only by campers in designated campgrounds or backcountry campsites or by surf fishermen. No permit is required for overnight surf fishing in Maryland.

Pets. Please leave pets at home. They are prohibited in Chincoteague National Wildlife Refuge, in Assateague State Park, in the primitive area north of the state park, and in all backcountry campsites. Pets are permitted elsewhere on the Maryland end of the island, but they must be on leashes no more than 6 feet long. This regulation is enforced because dogs can disturb other people, ponies, and shorebirds that nest directly in the sand or in marsh grasses. Sand and salt spray are hard on the feet and eyes of dogs, and insects can further endanger their health here. Really, it's better to leave your pets at home.

Feeding Wildlife. It is illegal to feed the ponies, deer, or other wildlife. Ponies and other wild animals have adapted to natural food and must depend on it throughout the year if they are to stay healthy. Feeding by humans also encourages animals to stay around roads, where many are hit by cars each year.

Hunting. Hunting is strictly prohibited on the wildlife refuge except for an annual deer hunt and for waterfowl hunting in Wildcat Marsh (see map). Contact refuge headquarters for details. In Maryland certain waterfowl and game species may be taken under state and federal regulations. Contact national seashore headquarters during September for information about hunting and for maps.

Poison Ivy, Mosquitoes, and Ticks. Guard against poison ivy, mosquitoes, and ticks—all abundant on Assateague Island in summer. Three different species of ticks are found on Assateague Island: dog, lone star, Northern deer (left to right). A tick bite may transmit various ailments. The Northern deer tick is known to carry Lyme disease. To avoid getting bitten, stay on trails, use commercial repellants, and inspect yourself carefully if you walk through grass or brush. Inquire at the visitor centers or campground office for additional information.

The National Seashore

Assateague Island is a barrier island built by sand that persistent waves have raised from the ocean's gently sloping floor. Constant reshaping mirrors a restless origin, as steady winds continue moving trillions of sand grains, each a bit of eroded ancient Appalachian Mountains. Occasional storms drive waves and sands so forcefully that beach and shoreline change dramatically. But Assateague's summer mostly means the lure of beaches and mild surf where shorebirds trace the lapping waves back down the beach. Behind the dunes, the island's forests and bayside marshes invite exploration. Now and then a wild pony wanders into view. Assateague Island consists of three major public areas (see the map): Assateague Island National Seashore, managed by the National Park Service; Chincoteague National Wildlife Refuge, managed by the U.S. Fish and Wildlife Service; and Assateague State Park, managed by Maryland's Department of Natural Resources. Assateague Island National Seashore is administered to provide for recreational use and enjoyment consistent with the maintenance and perpetuation of the seashore's natural communities. Together, these agencies hold in trust a priceless seashore heritage of wildlands, wildlife, and outdoor recreation. The National Park Service operates visitor centers serving both the Maryland and Virginia ends of the island. Visitor centers are the places to find out about naturalist activities, among other things. The **Barrier Island Visitor Center** at the Maryland end (see map) features exhibits, an aquarium, and maps and other publications. A naturalist will answer your questions. **For information** about seashore camping or other recreation and fees, write or call: Superintendent, Assateague Island National Seashore, Route 2, Box 294, Berlin, MD 21811, (301) 641-3030 or 641-1441.

Assateague State Park. The State of Maryland owns 680 acres of Assateague Island that it operates as a state park. Its beach offers separate swimming, surf fishing, and surf boarding areas. Ask about these at the state park entrance. Bathhouses, a bait and a tackle shop, and food service facilities are open in summer, when lifeguards protect the beach. See Camping for information about the state park campground. **For information** about the state park, write or call: Superintendent, Assateague State Park, Route 2, Box 293, Berlin, MD 21811, (301) 641-2120.

The Wildlife Refuge

The once-enormous waterfowl populations that migrated to the Delmarva region were dwindling at an alarming rate during the early 1900s. Wholesale conversion of wetlands to agriculture and private development, coupled with outlaw market gunning for food and plumage, threatened many bird species. The Chincoteague National Wildlife Refuge was established in 1943 as a wintering area for migratory waterfowl. The refuge is located on the Virginia end of Assateague Island and was purchased with Duck Stamp revenues. The Chincoteague refuge's prime Atlantic flyway habitat is essential to the survival of birds whose hereditary migrational instincts take them annually north and south on sometimes incredible seasonal journeys. Refuge management programs actively enhance this coastal habitat for the benefit of migratory and nesting birds and indigenous wildlife. The primary function of the refuge is to protect native and migratory species of wildlife and their habitat. The refuge is open to recreational uses centered around wildlife and wildland activities that are in harmony with this primary objective. Birdwatchers know the Chincoteague refuge as one of the East's finest places to add sightings to their life lists. Whitetail deer and the small Sika deer, an oriental elk released here in 1923, also inhabit its pine forests in the island's interior. The **Chincoteague Refuge Visitor Center** at the Virginia end (see map) provides information, descriptive leaflets, and schedules for interpretive activities, including guided walks and auditorium programs. A concessioner operates a series of wildlife and boat tours. You may make reservations for the tours at the visitor center. The access road off Beach Road is also the entrance to the Wildlife Drive (see map). **For information** about the refuge and visitor center seasons, hours, and fees, write or call: Refuge Manager, Chincoteague National Wildlife Refuge, P.O. Box 62, Chincoteague, VA 23336, (804) 336-6122. The National Park Service assists the Fish and Wildlife Service in providing services and managing recreational use in the Toms Cove area of Assateague Island's Virginia end. The **Toms Cove Visitor Center** offers exhibits and maps and other publications. For information about National Park Service naturalist or beach recreation activities there, call (804) 336-6577.

Snow geese

Treasures at the Atlantic's Edge

Birding

Although birds abound throughout Assateague, birders usually find more opportunities in the Virginia portion of the island. In summer, the refuge's freshwater impoundments combine with marshes all along Assateague to host a variety of herons, egrets, and other wading birds. Terns dive for fish and gulls and sandpipers work the beaches. Beyond the primary dune are birds you might also find in mainland thickets and pine forests. In early autumn, watch for migrating shorebirds and the peregrine falcon. In winter, waterfowl species include black duck, mallard, gadwall, pintail, ruddy duck, shoveler, and snow geese. Scoters, oldsquaws, and other sea ducks can sometimes be seen in Toms Cove or Assateague Channel. Ask at any visitor center for a checklist of the island's birds. **Endangered piping plovers nest at Assateague. Ask about nesting area restrictions.**

Great blue heron

Snowy egret

Dunlins

American widgeon

Black-crowned night heron

Peregrine falcon

William S. Seegar

Backcountry Camping

There are several backpack and canoe-access campsites on the island's Maryland end, each with a chemical toilet and picnic table but no drinking water. There is no fee. The three ocean side sites are open year-round and are available to hikers. The four bay side camps are available March 1 to October 31 and may be used by hikers or canoeists. Ocean sites are in open inner-dunes; bay sites sit among pine trees. Reservations are not necessary but parking and backcountry use permits are required. The nearest ocean side camp is 4 miles from parking. Write for free "Assateague Backcountry Camping" information at the national seashore address.

Naturalist Activities

Programs to enhance your enjoyment of the island's environment and unique recreation opportunities are offered at both the national seashore and the wildlife refuge. The **National Park Service** offers guided walks, talks, children's programs, and seashore recreation demonstrations daily in summer and on weekends in fall and spring. Guided walks include explorations of Assateague's birdlife, the beach, salt marshes, the bay, and dunes. Demonstrations include surf rescue and surf fishing. Clamming, crabbing, and canoe trips are available in Maryland. Check at the Barrier Island and Toms Cove Visitor Centers about programs at the island's Maryland and Virginia ends. The **Fish and Wildlife Service** offers guided programs exploring the refuge's birdlife, other wildlife, marshes, and the dynamics of a barrier island. There are also children's programs. For some programs, you must first sign up at the Chincoteague Refuge Visitor Center. Check there for schedules of all activities and auditorium programs, or to make reservations for wildlife boat and "Safari" bus tours offered by a concessioner. Wildlife work by various artists is exhibited summer weekends in the historic U.S.C.G. lighthouse oil shed, reached by a short walk on the Lighthouse Trail. Each year the wildlife refuge holds an open house during Waterfowl Week, generally around Thanksgiving, when large numbers of migratory birds use the refuge. Ask at the Chincoteague Refuge Visitor Center for specific dates for this year's Waterfowl Week.

The Official National Park Handbook, *Assateague Island,* tells about this barrier island's natural history of ponies, pirates, and shipwrecks. It walks you through the beach, dune, salt marsh, and bay environments with the author, world-renowned marine biologist William H. Amos. The traveler's guidebook section describes nearby accommodations and services, as well as recreation and nature activities on the island itself. The handbook is available at visitor centers.

Camping

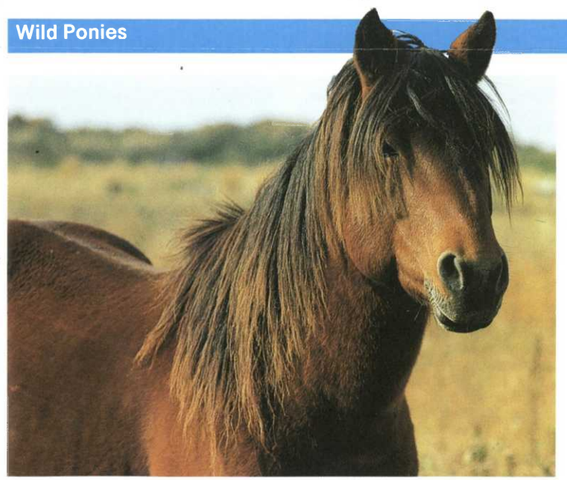
Seashore camping can be a memory to treasure—or a bad experience for the unprepared. There is no shade and mosquitoes can be abundant from mid-May to October. High winds can pull short tent pegs out of sand. Campgrounds at the Maryland end can be full in summer and waiting lists are used. For detailed information, write to the national seashore for free "Assateague Island Camping" literature.

Camping at the Virginia end. There is no camping on the wildlife refuge, which includes the entire Virginia end of the island. Find commercial campgrounds, usually with adequate space, on nearby Chincoteague Island: call Virginia's State Travel Service, (804) 825-5000, for information.

Camping at the Maryland end. The National Park Service offers two campgrounds, Oceanside and Bayside, with some sites available year-round. Primitive outdoor facilities include chemical toilets, drinking water, and cold, rinse-off showers. Any size camping unit can be accommodated (dump station only; no hookups). Some oceanside "walk-in" sites are for tents only. A campsite reservation system may be available in 1989—call (301) 641-3030. **Assateague State Park** offers a campground featuring bathhouses with hot showers and flush toilets. Any size camping unit can be accommodated (dump station only; no hookups). During winter, primitive facilities prevail. A small camp store and restaurant are open in summer. (National seashore campers must pay the state park day-use fee to enter the park and use these facilities). Summer reservations are available for a stay of a full week only—call (301) 641-2120.

Maryland's Pocomoke River State Park, a 45-minute drive from either end of the island, offers inland camping—call (301) 632-2566.

Wild Ponies



Two herds of wild ponies make their homes on Assateague Island. The herds are separated by a fence at the boundary between Maryland and Virginia. In Maryland, horses are often seen around roads and campgrounds. In Virginia, look for them in marshes off the Pony Trail observation platform. The Maryland herd is managed by the National Park Service. The Virginia herd is owned by the Chincoteague Volunteer Fire Company and allowed by permit to graze on Chincoteague refuge. Each year ponies from the Virginia herd are rounded up and many of the foals are sold at the Pony Penning and auction, held on the last Wednesday and Thursday of July. Proceeds from the pony auction help support the fire company. Today's wild ponies on Assateague Island are descended from domesticated stock that was grazed on the island as early as the 17th century by Eastern Shore planters. The planters grazed their horses here to avoid mainland taxes and fencing requirements. Smaller than horses, these shaggy, sturdy ponies are well adapted to their harsh seashore environment. Marsh and dune grasses supply the bulk of their food; they obtain water from freshwater impoundments or natural ponds. Their social organization, behavior, and communication habits are explained in publications available at visitor centers. Although domestic in their distant origins, these ponies are wild today. Respect them as such and view them only from a safe distance. **While usually appearing docile, they are prone to unpredictable behavior and can inflict serious wounds both by kicking and by biting. Do not feed or pet the ponies.**

☆ GPO 1989—242-345/80187 Reprint 1989