

PEA ISLAND NATIONAL WILDLIFE REFUGE

Narrative Report for the Period January 1 through April 30, 1962

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PEA ISLAND NATIONAL WILDLIFE REFUGE

REFUGE NARRATIVE REPORT

January 1 through April 30, 1962

Charles F. Noble, Refuge Manager
Houston C. Phillips, Wildlife Aid
Marvin C. Toler, Laborer

I. GENERAL

A. Weather Conditions

March 7th is a date that will long be remembered along this sea coast. The most destructive storm in the memory of most living people hit the coast. Tremendous waves washed and battered ocean front sand dunes and property. The ocean spilled over and broke through for the entire twelve mile length of the refuge. This was a freak 'North-easter' of tremendous ferocity. It came on a high spring tide which added to its flood damage potential. Sand dunes were washed down and broken at North and South Ponds; ocean waters flooded both impoundments. Erosion and breaks were common north of New Inlet, but from the New Inlet-Field Headquarters vicinity south to the refuge boundary there was scarcely a place where the ocean crest did not overflow the sand dunes. One third of a mile near the south end of the refuge was leveled, leaving the public highway and the refuge fence on the ocean beach. This March storm proves the great destructive potential of a strong north-easter along this Atlantic coast; its scars will be seen for a long time.

A beautiful fall and early winter ended when January arrived. Both January and February brought cloudy, cold winter weather with light, cold rains becoming commonplace. Rain was recorded on 18 days in January and 13 days in February although total rainfall for the two month period was near normal. The weather warmed near the end of February, but cold winds returned again in March. Spring weather came about a week later than normal, but by late April there was no doubt that spring was here. A high temperature for the four month period of 84 degrees was recorded on April 23rd and 27th while a low of 23 degrees was recorded on several dates in January and February. Precipitation for the four month period of 17.66 inches was 4.07 inches above normal.

Data recorded in the table at the top of the following page was taken from records furnished us by the Cape Hatteras Seashore Area from their weather station at Bodie Island. This weather station is located only three miles north of the refuge and reflects weather conditions on the refuge. Normal precipitation is based on a five year average.

<u>Month</u>	<u>Precipitation</u>			<u>Temperatures</u>	
	<u>This Month</u>	<u>Normal</u>	<u>Dev. from Normal</u>	<u>Max.</u>	<u>Min.</u>
Jan. -	5.76	3.26	+ 2.50	68	23
Feb. -	1.89	4.01	- 2.12	81	23
March -	4.87	4.03	+ 0.84	75	25
April -	5.14	2.29	+ 2.85	84	40
Totals -	17.66	13.59	+ 4.07	Extremes -	84 23

B. Habitat Conditions

1. Water Conditions

Two impoundments, North and South Ponds, constitute the areas on which water level control can normally be practiced to some degree. These areas, with a combined acreage of 1020 acres, were flooded by ocean water in the March 7th Storm to about a 9 ft. level. Normal water levels at the first of March are from 4.5 ft. to 5 ft.; of course, that water depth is obtained by rainfall, providing fresh water habitat within the impoundments. The storm subsided on Thursday, March 8, and on March 9 the water control gates were approached by boat and opened. The ponds continued to drain the remainder of the period and by the last day of April North Pond had reached a gauge reading of 4.78 ft. and South Pond a reading of 4.84 ft. Salting of the ponds by ocean flooding is expected to make drastic changes in these previously fresh water areas. Close inspection will follow to determine the best means of management for maximum waterfowl food production.

Prior to 'The Storm', water levels were satisfactory for waterfowl feeding. The ponds were used extensively through January. Pond water level had remained good for ryegrass growth in the North Pond field; little of the area had been flooded by rain water which is normally a factor in the lower parts of the field.

Pamlico Sound water levels have stayed slightly above normal most of the late winter and spring. Levels were satisfactory for goose use. No extremely high Sound tides developed as often does in late winter. Canada geese made heavy use of the Sound shoals north of New Inlet.

Staff gauge readings taken near the end of each month from both North and South Ponds will be found in the table at the top of the next page. Readings were not taken from March 7 to March 21 since flood waters were above the staff gauges. 1961 readings are also provided for comparative purposes.

Staff Gauge Readings

<u>End of Month</u>	<u>North Pond</u>		<u>South Pond</u>	
	<u>1961</u>	<u>1962</u>	<u>1961</u>	<u>1962</u>
January -	4.00	4.46	4.16	4.46
February -	4.46	4.40	4.48	4.50
March 7th -	Impoundments flooded by ocean to 9 ft. level. Water control gates opened and impoundments began draining on March 9.			
March 30 -	4.44	5.28	4.60	5.70
April -	4.16	4.78	4.50	4.84

Water salinity tests have been made on North and South Ponds during the period. Following is a table providing results of salinity tests; one series of tests just prior to 'The Storm' is included. The silver nitrate titration method was used to determine percent of sea strength.

Water Salinity Tests During Period
(Readings in % of Sea Strength)

<u>Date</u>	<u>North Pond</u>		<u>South Pond</u>	
	<u>North End</u>	<u>At Staff Gauge</u>	<u>North End</u>	<u>On West Side</u>
Before Flood:				
2/21/62 -	1.23%	1.23%	1.4%	1.23%
After Flood:				
3/27/62 -	45.8%	45.3%	54%	53.3%
4/3/62 -	42.8%	42.2%	48.9%	48.9%
4/12/62 -	33.4%	33.4%	37.8%	37.8%
4/20/62 -	32.4%	32%	34.5%	34.8%
4/25/62 -	32.6%	32.6%	34.3%	34.3%

2. Food and Cover

Available waterfowl food was more abundant throughout the wintering

season than is normal. Ducks found sufficient foods along the borrow pits of the North Pond and in the marshes of the South Pond through the end of January. By the end of January, rainfall had produced many puddles in the salt marshes to provide additional feeding habitat. The ryegrass field in North Pond provided good browse throughout the winter. Canada geese did not use the beach pea patches along the west side of the sand dunes to any extent; this is an indication that feeding conditions were better than normal for Canada geese. Beach pea is used extensively when other food supplies dwindle. All species of waterfowl found relatively good feeding conditions on Pea Island Refuge throughout the wintering season.

II. WILDLIFE

A. Migratory Birds

As usual, waterfowl dispersed soon after the close of waterfowl hunting season. This is true particularly of ducks and snow geese. Many of the birds move to the Bodie Island marshes north of Oregon Inlet. Canada geese do not disperse as rapidly as do the ducks and snow geese. Over half of the snow geese left the refuge immediately after the close of hunting season; they rapidly decreased and by the end of January a flock of only 200-300 continued using the refuge. The black ducks were more abundant on the refuge than normal with a count of 1700 in the last week of January; blacks used the North Pond until the last of January when they began using the salt marsh puddles and tidal creeks. A flock of 600-800 green-winged teal were seen several times and a sizeable number were present during most of the late winter period. The peak population of ducks this period was 4,130 as compared with 6,277 for the same period last year. Canada geese peaked at 6,800 this period as compared with 5,200 for the same period in 1961. The snow goose peak for this period was 3,000 as compared with 7,000 for the same period in 1961.

No flocks of redheads or canvasbacks were seen at Pea Island Refuge this winter. Five fulvous tree ducks were on the refuge during the first week of January. Blue-winged teal arrived early this spring, the first arriving at the last of February.

Notes on other migratory birds includes: first glossy ibises were seen on March 27; 4 black-necked stilts seen on April 27; double-crested cormorants blackened sand bars in Oregon Inlet during mid-April; common egrets began nesting on South Pond dike at the last of April; other egrets, herons, and glossy ibises first came to South Pond dike, but by the last of April it appeared that they were moving to an island in the North Pond for nesting and possible establishment of a rookery; laughing gulls are using islands in Oregon Inlet for nesting which lie near the ferry run but not within the Proclamation Boundary of the refuge.

B. Upland Game Birds

Ring-necked pheasants withstood the recent storm very well. The winter carry-over is estimated at 100 birds. Courtship was observed in mid-April. The wooded dike around the South Pond is the most prime area on the refuge for observing this species.

C. Fur Animals

Muskrats are the most abundant of the four species of fur animals found on the refuge. Some were lost during the March storm, but the species is still seen with regularity. Nutria and otter have been seen occasionally since the storm.

A small number of mink inhabit the refuge. At least one mink became a pest during duck trapping operations. Some portable welded wire duck traps were used; a few ducks were lost in these traps by predation which indicated that a mink was the culprit. This was the first time this had occurred at Pea Island; it is believed that one animal has learned to enter and leave the duck traps; this, of course, could become a nuisance if experienced during future banding programs.

The estimated population of fur animals will be found on Form NR-4 at the back of this report.

D. Hawks and Eagles

Observations of bald eagles are of special significance recently. None have been seen at Pea Island during this four month period. Duck hawks, marsh hawks, and sparrow hawks were seen during the cold weather months.

E. Fish

No fresh water species occur on the refuge. Salt water fishing had not begun at the end of April; there was practically no fishing in the area during this narrative report period. The salt water fishing usually begins in this area in May.

F. Diseases

Losses of Canada geese have been extremely low throughout this winter. Good food conditions prevailed for the most part; the lack of goose losses is attributed to the 'better than normal' feeding conditions. Only eight dead geese have been found on the refuge thus far.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Maintenance and Repairs

Preventive and necessary maintenance was performed on vehicles, light plants, water pumps, air-cooled engines, outboard motors, boats, waterfowl trapping equipment, etc. The body of the Chevrolet station wagon was reconditioned including patching of rusted out areas and painting. A 75,000 gal./hr. pump was brought from Back Bay Refuge and considerable work was done to this piece of equipment to get it in good operating condition. Surplus landing mats were laid for a work area. The reception office interior and exterior were scrapped and re-painted.

Following the March 7 storm, many cleanup jobs were performed including sand removal around buildings, cleanup of articles, tools, and equipment in a basement which was flooded, water control work, and trail debris clearing.

Sand dune repairs has begun under a National Park Service program. This is necessary due to the tremendous sand dune damage in the March storm. All funds for this repair work are being furnished by the National Park Service.

B. Plantings - Cultivated Crops

No plantings have been made during this period. However, an observation should be recorded. The 60 acres of ryegrass planted last fall and reported in the September-December report was inundated by salt water for 10 days following the March 7th storm. After the water was drained off the field, most of this grass came back and has looked in a strong and healthy condition up to the writing of this report.

C. Collections and Receipts

None.

D. Control of Vegetation

None during the period. However, the salt water flooding of the impoundments should have adverse effects on some species of undesirable plants including Eurasian watermilfoil.

E. Planned Burning

Attempts were made at burning two units of marsh, but neither would carry a fire; hence, no controlled burning was actually accomplished.

F. Fires

No building fires occurred. One small roadside grass fire was

quickly extinguished on April 27 which started either from a cigarette or by concentration of heat on dry grass through a bottle. This was of no consequence and did no damage.

IV. RESOURCES MANAGEMENT

No resources have been harvested and no concession exists on the refuge. Therefore, no financial income is being obtained from the refuge resources at this time.

V. FIELD INVESTIGATION

Records on water salinities in the two impoundments have been made weekly since the areas were flooded with salt water. This is an important factor at this time and the entire ecology of these impoundments is being watched closely. Water salinity records will be found under Water Conditions on Page 3.

Post season waterfowl banding was emphasized. However, results do not reflect the efforts made. Canada geese were unusually wary and would not come on bait with any regularity. Below please find listed the total winter records of waterfowl banding.

<u>Species</u>	<u>Birds Banded</u>	<u>Reportable Returns</u>	<u>Recoveries (Foreign Retraps)</u>	<u>Total Reported</u>
Canada geese -	55	4	1	- 60
Black ducks -	138	9	2	- 149
Mallards -	3	1		- 4
Pintails -	27			- 27
Scaup -	3			- 3
Ring-necked ducks -	2			- 2
American coots -	4			- 4
Totals -	232	14	3	
TOTAL RECORDS REPORTED IN WINTERING SEASON 1961-62 -				249
(All banding done in Jan. & Feb.)				

VI. PUBLIC RELATIONS

A. Recreational Uses

Bird watching and sightseeing constitute the recreational uses

during this period. Sport fishing, camping, beach combing, etc. were extremely limited through the last of April.

B. Refuge Visitors

1. Registered Visitors

149 visitors registered at the reception office located at Refuge Field Headquarters as compared with 152 for the same period last year.

2. Official Visitors

<u>Date</u>	<u>Name and Organization</u>	<u>Address</u>
Jan.	Mr. Foster Forbes, Wild. Prot., N.C. Wild. Comm.	Manteo, N. C.
1/25	Mr. C. E. Addy, Flyway Biologist, BSWF	Laurel, Md.
1/29	Mr. Al Noltmeir, Game Mgt. Agent, BSWF	Washington, N. C.
2/28	Mr. Clark Webster, Management Biologist, BSWF	Port Wentworth, Ga.
3/13	Mr. L. S. Givens, BSWF, Regional Office	Atlanta, Ga.
3/13	Mr. James Taylor, Engineer, BSWF, Regional Office	Atlanta, Ga.
4/2	Mr. Victor Kay, BSWF, Regional Office	Atlanta, Ga.
4/16	Mr. Philip VanDyck, BSWF, Regional Office	Atlanta, Ga.
4/16	Mr. Eugene Smith, Engineer, BSWF, Regional Office	Atlanta, Ga.

C. Refuge Participation

Dr. F. Eugene Hester and his class of 10 wildlife management students from N. C. State College were given a talk and tour of the refuge on February 23.

D. Violations

Violations throughout the wintering season were very low. Few indications were seen of waterfowl violations.

E. Safety

A safety meeting was held each month of this period. Subjects discussed were driving safety, a first aid booklet, Director Janzen's memo on safety objectives, 1961 Bureau accident statistics, precautions to take and communications during storm emergencies, use of pesticides, and the 1962 safety campaign catalog. The last acc-

ident at Pea Island Refuge was January 21, 1958. 1,559 calendar days have elapsed since the last accident. Approximately 20,772 man/hours of work have been performed since the last 'lost time' accident. For future protection of life and property, appeals have been made to establish a two-way radio system at Pea Island; consideration will probably be forthcoming.

VII. OTHER ITEMS

A. Oregon Inlet Bridge

A contract was let by the North Carolina Highway Commission in January, 1962 to McLean Contracting Company, Baltimore, Maryland for the construction of a bridge across Oregon Inlet. When this bridge is completed, it will eliminate all ferry rides between the mainland and Pea Island Refuge. A bridge across Alligator River on U. S. 64 was completed and opened in January of this year. Our Bureau, through the Bureau of Land Management, issued advance permission for the construction of a bridge approach on the south side of Oregon Inlet; this bridge approach crosses refuge lands. A hydraulic fill has been built on this right-of-way.

B. Road Re-location

The March 7th storm played havoc with the state highway passing through the refuge. Three to four feet of sand covered the road in many places; it was undermined in other places. One section was completely destroyed; the shoreline came in at this point and the road right-of-way became the beach front. Our Bureau authorized relocation of 2,560 feet of the road right-of-way near the south end of the refuge where the previous road was completely destroyed.

C. Sand Dune Repairs

\$308,000 has been requested by the Bureau for repairs to Pea Island Refuge as a result of the March Storm. \$220,000 of these funds was requested for sand dune repairs. Through agreement with the National Park Service, work has begun on repairs to the sand dunes at Pea Island. The Park Service is accomplishing the work with funds presently available to them, but it is possible that they will be reimbursed for work done on the refuge if and when the storm damage funds requested for Pea Island Refuge become available. A major sand dune rehabilitation job will be required to place the dunes back in the condition which existed prior to the storm.

D. Regional Refuge Conference

Refuge Manager Noble attended the Regional Refuge Conference held in Atlanta from January 15 to January 19.

E. Cabbed Jeep Acquired

A jeep was transferred from Okefenokee Refuge to Pea Island Refuge. The major intended purpose is to have a low value vehicle located at the ferry landing on the south side of Oregon Inlet. This will facilitate travel between the refuge office and field headquarters during tourist season. It will eliminate most traffic line waiting at the ferry landing during peak tourist season from June 1 to Labor Day.

F. Photographs

On the following pages are pictures which illustrate conditions at Pea Island Refuge following the March 7th Storm.

Date submitted: May 16, 1962 Respectfully submitted,
 Approved: Victor W. Ray Charles F. Noble
Acting Regional Refuge Supervisor Refuge Manager
MAY 18 1962

3-1750
Form NR-1
(Rev. March 1953)

W A T E R F O W L

REFUGE Pea Island Refuge

MONTHS OF Jan. 1 TO April 30, 1962

(1) Species	(2) Weeks of reporting period									
	6 days-use									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling	36	34	25	18	22	16	8	8	6	4
Trumpeter										
Geese:										
Canada	6,800	6,400	5,000	5,200	4,600	4,300	3,200	3,400	3,000	2,000
Cackling										
Brant										
White-fronted										
Snow	3,000	1,500	1,000	500	200	400	400	300	400	100
Blue	20	20	20							
Other										
Ducks:										
Mallard	100	100	100	100	100	100	50	50	50	20
Black	1,200	1,600	1,600	1,700	1,600	1,400	1,200	1,100	1,200	800
Gadwall	150	150	150	100	100	100	50	50	50	50
Baldpate	500	800	700	300	300	100	150	200	100	100
Pintail	500	400	700	400	500	100	200	200	300	200
Green-winged teal	300	350	300	800	700	400	500	400	500	400
Blue-winged teal								8	18	30
Cinnamon teal										
Shoveler	50	50	40	20	30	10		12	22	20
Wood										
Redhead										
Ring-necked	200	150	150	50	50	50	50	50	25	25
Canvasback										
Scaup	200	100	150	200	200	150	50	50	25	25
Goldeneye										
Bufflehead	200	200	200	200	200	200	200	200	200	200
Ruddy	20	20	20	20	10	10	10	10	10	
Other										
Hooded Merganser	50	30	20							
Fulvous tree duck	5									
Coot: American	700	500	500	400	400	400	300	300	300	300

3 -1750a

Cont. NR-1

(Rev. March 1953)

W A T E R F O W L
(Continuation Sheet)

REFUGE Pea Island RefugeMONTHS OF Jan. 1 TO April 30, 19 62

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen: total
	11	12	13	14	15	16	17	18	2 days-use	
Swans:										
Whistling	2									1,217
Trumpeter										
Geese:										
Canada	400	200	100	100	100	100	50	50		307,950
Cackling										
Brant										
White-fronted										
Snow										51,600
Blue										400
Other										
Ducks:										
Mallard	20	20	20	20	10	10				5,990
Black	300	300	200	200	200	250	150	150		103,400
Gadwall	50	50	50	50	50	100	100	150		9,950
Baldpate	50	20	20							22,880
Pintail	50	50	30	30						25,120
Green-winged teal	150	200	200	200	200	50				39,250
Blue-winged teal	50	100	200	400	200	200	100	100		9,342
Cinnamon teal										
Shoveler	30	50	50	50	20	20				3,268
Wood										
Redhead										
Ring-necked	25	25	25	25						6,100
Canvasback										
Scaup	25	25	25	25						8,550
Goldeneye										
Bufflehead	200	200	200	100	20	10	10	10		19,000
Ruddy										990
Other										
Hooded Merganser										650
Fulvous tree duck										30
Coot: American	200	50	50	50	50	10	10	10		30,960

(over)

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans	1,217	36		Principal feeding areas <u>Impoundments, fresh marshes, salt marshes, ryegrass field, and Pamlico Sound shoals.</u>
Geese	359,950	9,820		
Ducks	254,520	4,130		Principal nesting areas _____
Coots	30,960	700		
646,647 - Total Waterfowl Days-Use				Reported by <u>Charles F. Noble, Refuge Manager</u>

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS

(other than waterfowl)

Refuge Pea Island RefugeMonths of Jan. 1to April 301956

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Little blue heron	3	2/23	20	4/30	20	4/30				50
Louisiana heron	8	1/29	70	4/30	70	4/30				120
Black-crowned night heron	8	1/29	90	4/30	90	4/30				150
Common egret	4	1/29	50	4/30	50	4/30				70
Snowy egret	6	1/29	100	4/30	100	4/30				170
Glossy ibis	3	3/27	25	4/30	25	4/30				30
Common loon	3	1/29	30	3/27	2	4/27				50
Double-crested cormorant	2	1/29	1,500	4/3	500	4/30				3,000
Clapper rail	No accurate data due to secretive nature of species.									150
Gannet	10	1/29	400	3/27	3	4/3				800
II. <u>Shorebirds, Gulls and Terns:</u>										
Common tern	10	3/27	250	4/27	20	4/30				400
Royal tern	6	4/3	40	4/27	4	4/30				80
Least tern	6	3/27	50	4/27	10	4/30				150
Herring gull	300	1/4	2,000	1/29	12	4/30				3,000
Ring-billed gull	300	1/4	2,500	1/29	20	4/30				4,000
Laughing gull	2	1/29	2,000	4/30	2,000	4/30				3,000
Willetts	12	3/27	200	4/30	200	4/30				300
Black-necked stilts	4	4/27	4	4/27	4	4/27				4
American avocets	8	4/30	8	4/30	8	4/30				8
Oyster catcher	1	3/27	2	4/27	2	4/27				6
Yellowlegs, great. & less.	4	1/29	400	4/3	80	4/27				500
Sandpipers, all species	200	1/29	1,500	4/27	150	4/30				2,000

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	4	3/27	18	4/27	18	4/27				30
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	2	1/29	4	2/28	2	3/6				6
Reported by.....Charles F. Noble, Refuge Mgr.										

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

(April 1946)

UPLAND GAME BIRDS

Refuge Pea Island Refuge

Months of Jan. 1 to April 30, 19 62

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked pheasant	Dikes, wax myrtle thickets, uplands, and marshes	11							100	
	* Density figure based on habitat of 1080 acres.									

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Pea Island Refuge

Year ending April 30, 1962

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion	
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
								Permit Number	Trappers Share	Refuge share				
Muskrate	Impoundments and adjacent area (1500 acres)	1.5												1,000
Otter	Range over all of the land and marsh area and tidal creeks(5880 acres).	392												15
Nutria	Impoundments and adjacent area (1500 acres)	20												75
Mink	Entire refuge area. (5880 acres)	588												10

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS:

2 Nutria destroyed during period.

Reported by Charles F. Noble

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

- (1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)
 - (2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
 - (3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed.
 - (4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprime-ness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.
 - (5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.
- REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.



General condition of the dune line looking south from refuge field headquarters following the March 7th Storm.



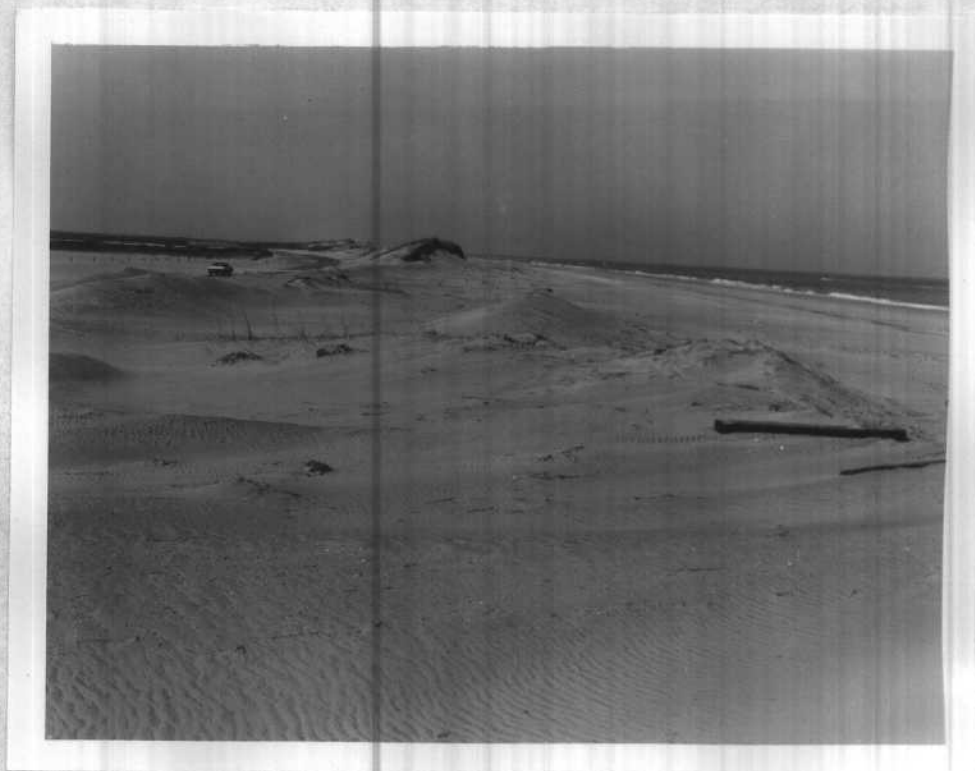
General condition of the dune line looking north from refuge field headquarters following the March 7th Storm.



This is the profile of the ocean side of the sand dunes after the storm where the dunes were high and wide prior to the storm.



Picture shows the back or west side of the sand dunes. Note the breaks which are the places where these high dunes were flattened.



The sand dune line here had been repaired last fall(fall, 1961). It was dozed up from the ocean side, sand fenced, and planted to grass. Nevertheless, the ocean broke through and over and destroyed the work of last fall. Picture below is the same area prior to the storm.





Here the sand dunes were flattened completely, the public highway destroyed, and the fence which was located along the edge of the marsh destroyed. Picture above looking north to south. Picture below looking south to north.





Field headquarters as seen from near the ocean water line. No protective sand dunes remain between the residence and the ocean.



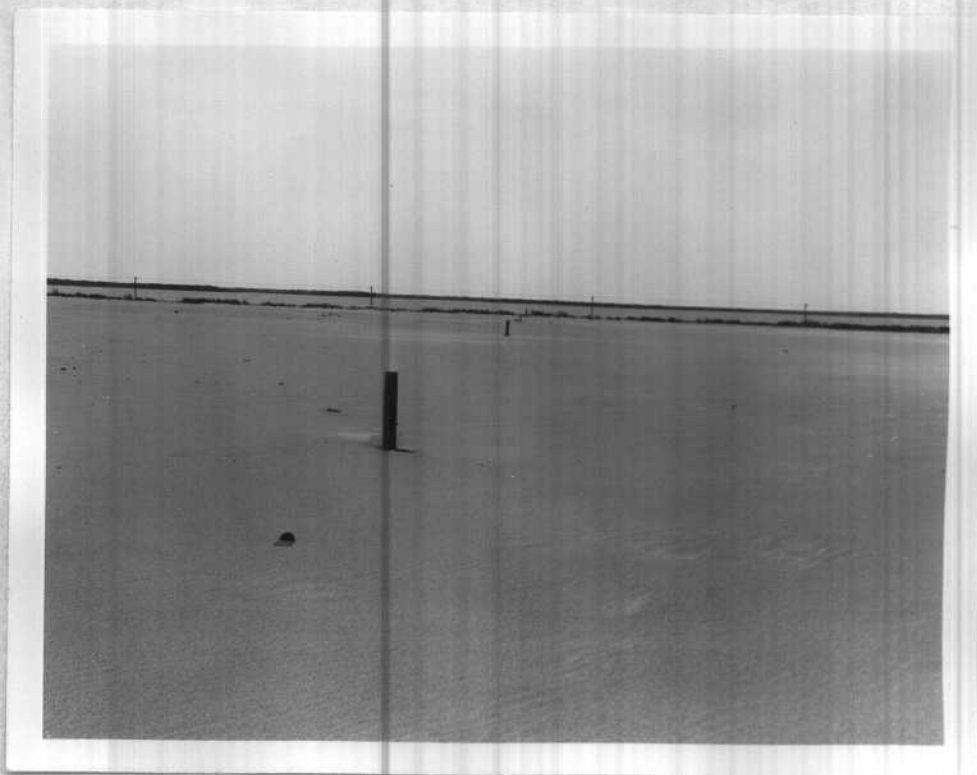
Some breakthroughs caused severe washing of the marsh vegetation beyond the area where sand was deposited as shown in this picture.



The fence line was badly damaged where the sand and water crossed from the east side of the public road to the west or marsh side of the road.



Sand was deposited along the fence line and in some cases completely over the fence posts.



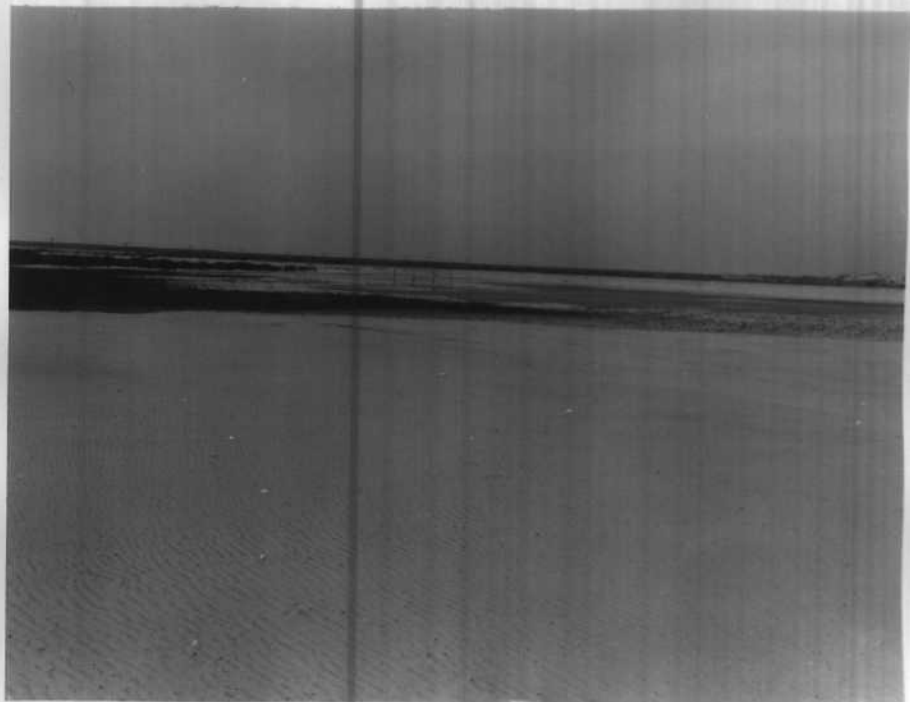
The posts in line were a vegetation transect across a ryegrass field and marsh to an open fresh water pond. Sand covered the field and marsh at this point. You are looking from east to west.



Fingers of sand were deposited in fresh and salt marshes over much of the refuge.



Sand deposited in a millet field and marsh.



Sand was deposited over about 20 acres of this ryegrass field which produces browse annually for the Canada goose flock.



This drift line indicates the level to which ocean water flooded the 640 acre North Pond.



A drift line can be seen as an extension along this jeep hood. The jeep is on a jeep trail which is usually over 2 feet above water level. This drift line indicates the water level from ocean flooding in the 375 acre South Pond.