PEA ISLAND NATIONAL WILDLIFE REFUGE

Narrative Report for Period September 1 through December 31, 1959

Table of Contents

PEA ISLAND NATIONAL WILDLIFE REFUGE

REFUGE NARRATIVE REPORT

September 1 through December 31, 1959

Charles F. Noble, Refuge Manager
Houston C. Phillips, Refuge Aid

I. GENERAL

A. Weather Conditions

The one most important factor concerning the weather for the present report period has been the lack of rainfall. In fact, the lack of rainfall for the last eight months is significant. For the calendar year 1959, a deficiency of 10.71 inches was recorded. It is more important to note this deficiency when precipitation for the last eight months is considered since this includes all of the warm weather months and fall; since May 1, Pea Island Refuge has received 22.84 inches, or over 18 ½ inches less than the average normal for the past five years.

It is good to report that no hurricanes came close enough to affect this area this fall. One alert came near the 1st of September but the hurricane went inland without so much as producing cloudy skies in this area.

North-easters are expected during these months. Only six times have they developed and none have been severe. The highest wind recorded was 29 m.p.h.

This fall and winter have been relatively mild. No hard freezes have occurred. The lowest temperature recorded this period was 28 degrees as compared to a low of 22 degrees during this period last year. In general, the weather conditions have been good.

The following weather data was furnished us by the National Park Service from their weather station located three miles north of the refuge. It reflects weather conditions as they actually are on the refuge. For normal precipitation, the five year average since this weather station has been operated is used.

Month	Precipitation			Temperatures	
	This Month	Normal	Dev. from Normal	Max.	Min.
Sept. -	4.18	6.96	- 2.78	91	59
Oct. -	2.81	4.80	- 1.99	88	44
Nov. -	2.01	3.03	- 1.02	80	28
Dec. -	4.09	3.32	+ 0.77	67	32
Totals -	13.09	18.11	- 5.02	Extremes - 91	28

Precipitation for 1959 - 38.59 inches
Average Normal Annual Precipitation - 49.30 inches

Year 1959 Deviation from Normal - - 10.71 inches

B. Habitat Conditions

1. Water Conditions

Within the two impoundments the water level has been extremely low for late fall and winter. The South Pond was almost dry even as late as mid-November. The North Pond has been low, but only narrow marginal edges of the pond bottom have become exposed.

Water conditions in the Pamlico Sound portion of the refuge remained good through the latter part of the growing season. No strong storms developed to destroy this vegetation. Tides have been higher in these waters than during the fall of 1958.

Below is comparative data on both impoundments for the last four months of 1958 and 1959.

Staff Gauge Readings

End of Month	North Pond		South Pond	
	1958	1959	1958	1959
Sept. -	4.12	3.78	4.28	3.46
Oct. -	4.40	3.80	4.46	3.50
Nov. -	4.50	3.90	4.78	3.82
Dec. -	4.90	4.26	5.00	4.38

2. Food and Cover

To date the available waterfowl foods have been adequate for the population which the refuge has carried. Salt marshes cordgrass and salt meadow cordgrass are still abundant. Submerged aquatics in the two fresh water impoundments are almost gone. The marshes of the South Pond has carried good numbers of waterfowl; however, it will soon be eaten out if a good flock of birds continue to use it. If the water level rises, however, it will inundate some additional acreage of marsh making additional food available. The 25 acre millet field was used for about two weeks by several hundred Canada geese and since that time has practically been abandoned. Here again, if parts of this field are inundated, dabbling ducks are expected to make use of it. The ryegrass field located in the North Pond is probably the best ever produced at Pea Island. Continued use has been made of it. Under unusually bad weather conditions as many as 3000 Canada geese have been seen using this field. Weather being mild, plant growth continues with heavy browsing.

The shoal areas on Pamlico Sound still provide a good source of food, particularly for the Canada goose flock. Use of this area has been much less than last year until near the end of December.

A large area of marsh on the north end of the refuge was burned on December 20. This area will provide an additional feeding area for snow and Canada geese.

II. WILDLIFE

A. Migratory Birds

1. Waterfowl

The first wintering species of ducks arrived on September 21 when 150 American widgeons and 50 pintails were seen resting on the North Pond. These species increased rapidly in the first and second weeks of October, followed a few weeks later by increasing numbers of black ducks and green-winged teal. About the first of December a flock of 3000 pintails began to use the rich smartweed marshes of the South Pond. A sizeable flock of ducks used this marsh throughout December. Last year only meager numbers of ducks used the South Pond marshes. On the refuge, duck-use has been on a par with last years use; however, in surrounding areas duck populations have been exceptionally low. The peak population last year was just over 9000 and again this year it has been slightly over 9000. Species composition has changed somewhat with bufflehead showing a definite

1. Waterfowl - Continued

increase and ruddys and diving ducks decreasing. Coots also have decreased noticably.

The first Canada geese arrived in a flock of 18 on October 5. The major influx of this species came in the third and last weeks of October. Canada geese have shown a definite decline on the refuge as compared to last year. The peak population during this period has been 5400 as compared with 8400 last year. The greatest change has been that no large flocks have used the Pamlico Sound shoals as they did last year. Canada geese have fed in the cordgrass marshes more this year, particularly in the early part of the season.

A flock of 45 snow geese arrived on October 26. The beginning of the rapid increase came on Armistice Day, November 11 when a flock of about 3000 arrived on the North Pond. The peak population has been 7600 which is a decrease of 13% from the 8800 recorded last year. By the last of December nearly the entire flock was using the controlled burned marsh on the north end of the refuge. Early in the season the flock was disbursed and flocks of 15 to 4000 could be found from one end of the refuge to the other end.

2. Wading Birds, Gulls, Terns, and Shorebirds

With a late fall, many of the wading birds lingered late. The majority of the herons and egrets began leaving about October 1. The glossy ibis was seen as late as October 5.

Black skimmers were flocking before leaving on November 3. They were also seen later in the month. Brown pelicans were also in this area on November 3.

All species of gulls showed a decline as compared to last year. Those found in the area at this time are herring, ring-billed, and black-backed gulls.

The American avocet is frequenting the refuge in larger numbers than in past years. Fourteen were seen on the edge of the South Pond as late as November 11..

B. Upland Game Birds

The ring-necked pheasant is the only upland game bird found on the refuge. Its population is estimated at forty. It ranges from the north tip of the refuge to the south boundary.

C. Fur Animals, Predators, Rodents, and Other Mammals

There has been little change in the estimated population of muskrats, the major fur bearer, which stands at approximately 2000.

The first refuge record of a rabbit being found on Pea Island Refuge came this fall. One was killed by a car on the highway near the South Pond dike on November 2.

D. Hawks, Eagles, and Crows

Few crows are seen at Pea Island, but boat-tailed grackles are common and often feed on the corn placed at goose trapping sites.

Marsh hawks, duck hawks, and sparrow hawks have been seen this winter.

E. Fish

Surf fishing is common along the 13 mile beach line on the refuge. A fair run of spotted weakfish(speckled trout) produced some fishing during November and December. Not too many fishermen found these since it was late in the season. Flounder fishing in early fall was good, and numbers of fishermen made good catches in the Oregon Inlet vicinity. Few channel bass were caught this fall although one fisherman caught one directly in front of Pea Island Refuge Field Headquarters.

F. Diseases

Few sick geese have been observed. Only four dead Canada geese have been found this winter; all were in December.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

No major development projects are underway at Pea Island.

The usual maintenance schedules have been maintained during the period. The patrol cabin re-vamping job was completed which includes door replacements, floor repairs, rigging oil storage drum outside, and giving a complete paint job to the inside. Fence repairs were made; roads around the ponds were mowed and the brush cut; a gas heating stove was installed in the reception office; the hot water heater in the residence was replaced; regular maintenance to vehicles and tractors was accom-

A. Physical Development - Continued

plished; many other minor maintenance and repair jobs were done. Fire lines were re-plowed on units set up for planned burning.

B. Plantings - Cultivated Crops

Sixty acres of annual ryegrass was planted in the North Pond by mowing, seeding, and fertilizing. After mowing low, the field was seeded at the rate of 100 pounds to the acre. 150 pounds per acre of 10-20-20 fertilizer was applied. Three weeks later the crop was top dressed with 100 pounds per acre of 33 1/3% ammonium nitrate. Conditions at planting were ideal for equipment operation. Following the initial operation, showers came which helped produce a good stand over the entire field. Most plants have survived and remained green up to this date. Canada geese have used the area continually since the first of November. Thsi probably the best browse crop year so far at Pea Island.

C. Collections and Receipts

None.

D. Control of Vegetation

1. Mechanical Control

A 20 acre area of large wax myrtle and black locust in the North Pond was plowed and dozed. Another years operation on this area will be required before it will become a productive marsh.

2. Herbicidal Control

Widely scattered patches of cattail were treated during a period from May 18 through May 28. All infestations treated were scattered over approximately 120 acres in the South Pond; they were from a few stems to one-half acre in size. The early date of spraying was due to the rapidly dropping pond level and the necessity to operate from a boat.

The total acreage treated was approximately 6 acres composed of 90% Typha domingensis and 10% T. angustifolia. Little floral development had begun and leaf development was only half mature. The plants were treated with 18.75 pounds acid equivalent per acre of dalapon(Dowpon) in 40 gallons of water. For the operation a gun jet nozzle was used with 100 feet of hose and pump mounted on a boat which was pulled. The cost of the materials for the operation was $230.00 plus 96 man-hours labor which

2. Herbicidal Control - Continued

should be rated at $1.00 per hour labor. This was the first treatment and produced an apparent 90% kill.

A mop-up job on cattail eradication of small patches is expected to continue on a yearly basis to hold this pest plant in check.

E. Planned Burning

To be reported in the narrative report for the period ending April 30, 1960.

F. Fires

No wild fires or building fires occurred during the period. Planned burning was carried out as scheduled.

IV. RESOURCES MANAGEMENT

A. Commercial Fishing

Commercial fishing crews operate along the ocean surf. No special permits are required for this activity. Good catches of very large stripped bass were made by haul net operators in the surf in mid-December. On December 17 one crew was observed making a catch; the smallest stripped bass caught weighed about 25 pounds; some ran up to 65 or 70 pounds. This fishing only lasted 3 or 4 days before sea conditions stopped netting operations.

B. Concessions

Pea Island Campground Store, located on the north end of Pea Island at Oregon Inlet, is a concession for which the National Park Service is responsible. Revenue from this concession is received by our Service at a Regional Office level.

Mr. James S. Turner was released was concessionaire at his request. Mr. John F. Connor succedded Mr. Turner on September 22, 1959. Mr. Connor plans to maintain residence with his family on the premises on a year-round basis. So far, his operation of the facility has been a vast improvement over the previous concessionaire.

V. FIELD INVESTIGATION

Field investigation has consisted of weekly waterfowl counts, waterfowl food condition checks, routine search for sick or dead Canada geese, and a special census to locate all mallards in this area.

VI. PUBLIC RELATIONS

A. Recreational Uses

Total recreational-use days as determined by occasional spot checks will be found on Form NR-6.

The major use is sight-seeing. Other uses are fishing, bird watching, nature study, beach combing, photography, and a small amount of ocean bathing.

B. Refuge Visitors

1. Registered Visitors

252 visitors from 21 States, the District of Columbia, Canada, and the Belgian Congo registered during this period at the reception office located at field headquarters.

2. Official Visitors

Name and Organization	Date	Address
Mr. Carl Fermanich, BSFW	10/13	Washington, D. C.
Mr. Richard Dittman, BSFW	10/13	"
Mr. Lawrence S. Givens, BSFW, R.O.	10/15	Atlanta, Ga.
Mr. Billy F. Horton, BSFW, R.O.	11/4	"
Mr. James A. Taylor, BSFW, R.O.	11/4	"
Mr. Thomas Martin, BSFW	12/9	Chincoteague, Va.
Mr. Al Noltemeier, BSFW	12/30	Washington, N. C.
Mr. Wade Refister, N. C. Wild. Prot.	12/30	Kitty Hawk, N. C.
Mr. Carl Yelverton, BSFW	12/31	Back Bay, N. C.

C. Refuge Participation

At the request of the National Park Service Superintendent, the manager attended the pre-hunting season meeting on regulations on November 6 at their visitor center. I was the only representative of our Service present and supplied information and literature on federal regulations applicable.

C. Refuge Participation - Continued

With Messrs. Fermanich and Dittman the manager attended a meeting and field trip on sand dune stabilization on the Seashore Area on October 13 and 14.

D. Violations

Rumors and some few signs indicated a minor amount of poaching on the refuge. Patrol was set up for several nights and days. No activity associated with violations was observed at these times; it is felt that very little game violations occur on the refuge since all patrols both day and night turned up no violations.

VII. OTHER ITEMS

A. Canada Goose Nasal Gland Study

By direction from the Regional Office, Canada goose head collections have been conducted at the National Park Service public hunting area check-out station at Bodie Island. Time did not allow adequate coverage of this detail, but very good cooperation was received from the N.P.S. on this activity. These heads were collected for Dr. Harold C. Hanson of Illinois State Natural History Survey for nasal gland studies in connection with salt secretion. 18 heads were collected from a total of 88 geese killed on this public hunting area.

B. Photographs

Please find snapshots pertaining to the refuge on the following page.

Date submitted: January 15, 1960 Respectfully submitted,

Approved: [signature] Charles F. Noble

Regional Refuge Supervisor Refuge Manager

Jan. 20, 1960

Part of marsh on the north end before burning.

The same marsh after burning on December 20th.
6000 snow geese were using this are ~~an~~ Dec. 30.

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

WATERFOWL

REFUGE Pea Island MONTHS OF Sept. 1 TO Dec. 31, 1959

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling								4	35	50
Trumpeter										
Geese:										
Canada						200	500	2250	3800	3900
Cackling										
Brant										
White-fronted									75	250
Snow								27	5	10
Blue										
Other										
Ducks:										
Mallard								6	20	20
Black	250	200	200	200	250	300	500	700	700	700
Gadwall	400	400	400	350	350	400	400	600	550	500
Baldpate				150	150	900	1800	2500	2200	1800
Pintail				50	100	600	1300	1500	800	850
Green-winged teal								100	150	110
Blue-winged teal	300	300	200	100	70	50	30	10	10	
Cinnamon teal										
Shoveler										7
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Red-breasted Merganser	450	350	200	100	100	100	100	100	50	50
Unidentified								50	375	500
Coot:							20	30	200	200

Int. Dup. Sec.,
Wash., D. C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Pea Island MONTHS OF Sept. 1 TO Dec. 31, 1959

(1) Species	(2) Weeks of reporting period 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production Broods seen	Estimate total
Swans:											
Whistling	55	60	60	65	55	35	30	50	3,493		
Trumpeter											
Geese:											
Canada	3300	3500	3800	5400	4600	5200	4300	4800	322,350		
Cackling											
Brant											
White-fronted											
Snow	2800	6000	6500	7500	7500	7300	7600	6200	362,075		
Blue	10	10	10	10	10			12	728		
Other											
Ducks:											
Mallard	30	50	50	150	120	150	120	150	6,272		
Black	700	800	650	2200	2000	1600	1500	1200	103,950		
Gadwall	250	300	250	350	450	400	300	250	47,000		
Baldpate	600	650	650	600	550	700	350	700	100,100		
Pintail	900	900	1100	3200	2400	2200	1200	1300	126,200		
Green-winged teal	60	100	300	250	300	600	350	225	17,365		
Blue-winged teal									6,890		
Cinnamon teal											
Shoveler	10	20	40	75	100	60	50	40	2,734		
Wood											
Redhead	25	10		10	10		20		523		
Ring-necked											
Canvasback	4								28		
Scaup	100	100	80	300	400	600	500	350	16,310		
Goldeneye											
Bufflehead	350	1900	2000	1300	1200	1000	600	500	60,950		
Ruddy	10	10	15	60	100	80	90	40	2,755		
Other											
Red-breasted Merg.	25	100	200	600	800	1000	1000	1200	42,375		
Unidentified	400	350	300	200	400	200	200	200	21,825		
Coot:	300	500	500	400	400	350	300	250	23,650		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	3,493	65	
Geese	685,153	12,910	
Ducks	555,277	9,305	
Coots	23,650	500	

SUMMARY

Principal feeding areas Eyegrass field, tow fresh water impoundments, salt marsh, and Pamlico Sound shoals.

Principal nesting areas

Reported by Charles F. Noble, Refuge Manager

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).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Pea Island Months of Sept. 1 to Dec. 31 1949

(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. Water and Marsh Birds:										
Herons, Little blue	Res.		80		2	12/30				100
" , Louisiana	"		90		8	12/30				120
" , Black-crowned night	"		140		14	12/30				180
" , Great blue			12		11	12/30				15
Egrets, Common	Res.		60		6	12/30				80
" , Snowy	"		180		8	12/30				200
Ibis, glossy	Sum. Res.		40		2	10/5				50
Rails, clapper	Res.									200
Cormorants, double-crested			600	10/20	20	12/30				1000
Gannets			75		10	11/28				100
Loons, common			25		6	12/30				50
II. Shorebirds, Gulls and Terns:										
Tern, Common			400		50	11/5				500
" , Royal	Sum. Res.		70	10/20	6	11/5				150
Gulls, Herring			500	12/5	200	12/30				700
" , Black-backed			200	12/5	30	12/30				300
" , Ring-billed			2000	12/5	200	12/30				2000
" , Laughing			2500	9/10	10	12/5				2500
American avocet			40	9/10	14	11/11				40
Yellow legs, Great. & less.			500		60	12/30				700
Sanderlings, all species			1000		100	11/28				1200

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove	Only occasionally is a dove seen on Pea Island Refuge.									
White-winged dove										
IV. Predaceous Birds:										
Golden eagle										
Duck hawk	1	11/5	4		1	12/30				
Horned owl										
Magpie										
Raven										
Crow										
Sparrow hawk			5		1	12/30				

Reported by Charles P. Noble

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 Gruiiformes
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.

INT.-DUP. SEC., WASH., D.C.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Pea Island Months of Sept. 1 to Dec. 31, 1959

(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'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasanat	Dikes, wax myrtle growths, Spartina patens cover, & other marshes								40	

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.

Form NR-3
(June 1945)

BIG GAME

Refuge Pea Island Calendar Year 1959

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
	No big game on the refuge.													

Remarks:

Reported by Charles F. Noble

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: 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 total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

116008

3-1755
Form NR-5
60701

DISEASE

Refuge Pea Island Year 19 59

Botulism

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks _____

Lead Poisoning or other Disease

Kind of disease UNKNOWN

Species affected Canada geese

Number Affected Species	Actual Count	Estimated
Canada geese	9	25

Number Recovered _____

Number lost _____

Source of infection Probably saline marshes

Water conditions _____

Food conditions Good

5 found in Jan. & Feb.; 4 found in Dec.
All birds found were dead.

Remarks This number is well within an expected death rate.

3-1756
Form NR-6
(Rev. August 1957)

PUBLIC USE

Refuge Pea Island Calendar Year 1959

Total Use Visitor-Days	Hunting Use	Fishing Use	Miscellaneous Use
13,000		3000	9000

Where practical, by means of occasional spot checks, or other methods, show by percent and visitor-days the breakdown of the above figures and other related information:

Hunting (on refuge lands):	Percent	Visitor-Days	Acres
Waterfowl	None		
Upland Game	None		
Big Game	None		

Supervised by refuge ____ by State ____ No. of blinds ____

Miscellaneous:	Percent	Visitor-Days
Recreation *	60%	7800
Official		
Economic Use		
Other	40%	5200

Hunting (off refuge lands): Estimated man-days of hunting on lands adjacent to the refuge 965 (These figures should not be included in hunting-use totals above).

Comments:

Fishing:

13 miles of ocean front which is fished.

Acres of ponds or lakes ____ and miles of streams ____ open to fishing.

*(including picnicking, swimming, boating, camping, viewing wildlife, and photographing)

INT.-DUP. SEC., WASH., D.C. 22919

Form NR-7

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Pea Island Year 1950

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Planting	Survival	Cause of Loss	Remarks
No marsh planting accomplished this year.								

TOTAL ACREAGE PLANTED:

Marsh and aquatic_____
Hedgerows, cover patches_____
Food strips, food patches_____
Forest plantings_____

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Pea Island County Dare State North Carolina

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Japanese millet							25 acres	Waterfowl seed crop	25
Annual ryegrass							60 acres	Winter goose browse	60
		(Farming accomplished by refuge personnel.)							
								Fallow Ag. Land	

No. of Permittees: Agricultural Operations 0 Haying Operations 0 Grazing Operations 0

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle				
				2. Other				
				1. Total Refuge Acreage Under Cultivation				85
Hay - Wild				2. Acreage Cultivated as Service Operation				85

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Pea Island Months of Sept. through Dec., 195.9

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Shelled corn	None	85 bu.	85 bu.			25 bu. for trapping		60 bu.		60 bu. for trapping	None

(8) Indicate shipping or collection points Received from Carolina Sandhills Refuge by Railway freight.

(9) Grain is stored at Pea Island Refuge Field Headquarters

(10) Remarks

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 59323

Form NR-9

COLLECTIONS AND RECEIPTS OF PLANTING STOCK
(Seeds, rootstocks, trees, shrubs)

Refuge Pea Island Year 19X 52

Species	Collections				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period or Collection	Method	Unit Cost	Amount	Source		
None for the year.								

3-1761
Form NR-11

TIMBER REMOVAL

Refuge Pea Island Year 1941

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
No timber on Pea Island Refuge.								

Total acreage cut over..... Total income.....

No. of units removed B. F..... Method of slash disposal.....

Cords.....

Ties.....

.....

PEA ISLAND NATIONAL WILDLIFE REFUGE

Narrative Report for the Period May 1 through August 31, 1959

Table of Contents

RAA ISLAND NATIONAL WILDLIFE REFUGE

REFUGE NARRATIVE REPORT

May 1 through August 31, 1959

Charles F. Noble, Refuge Manager
Houston C. Phillips, Refuge Aid
James F. Parnell, Student Assistant

I. GENERAL

A. Weather Conditions

The most significant feature of the over-all weather review for the last four months has been the extreme dry and extremely wet periods. Less than one inch of rain fell in the extremely dry spring months of May and June. This was followed by downpours in mid-July. Since the rainy period in July, rainfall has been below normal and drying conditions have persisted.

No hurricanes have come close by so far this season. North-easters have been few and carried only light winds. A few strong southwest winds have developed. One which persisted for several days in early July produced the strongest tide flowing out of Oregon Inlet for nine or ten years. Ferry operation was interrupted on July 10 due to tides flowing out that were too strong to allow ferries to tie up on the south side of Oregon Inlet.

High temperature with calm wind conditions have been prevalent this summer. Local folk say that it has been one of the most uncomfortable summers for many years in this area.

The weather data below was furnished us by the National Park Service from their weather station located three miles north of the refuge. It reflects weather conditions on the refuge. Normal precipitation is the average of the five year period in which this weather station has been in operation.

Month	Precipitation			Temperatures	
	This Month	Normal	Dev. from Normal	Max.	Min.
May -	0.29	3.26	- 2.97	89	49
June -	0.59	3.08	- 2.49	97	52
July -	6.42	3.77	+ 2.65	94	68
August -	2.45	7.49	- 5.04	95	60
Totals -	9.75	17.60	- 7.85 Extremes-	97	49

B. Habitat Conditions

1. Water Conditions

A direct correlation between pond levels and precipitation or the lack thereof is evident. By the last of May both ponds were dropping rapidly. However, it has been more noticeable in the south pond throughout the summer. At the last of June the south pond was dry except for the borrow pits and a few isolated puddles near islands within the impoundment. The north pond never became dry. The rains in mid-July raised the pond levels, but by the last of August water levels in both ponds had dropped. By this time the south pond was again in danger of becoming dry; the pond bottom was becoming exposed around its perimeter for the second time this season.

Few strong winds have occurred. Therefore, the water in Pamlico Sound has been clear. Ideal conditions have existed for submergent aquatic growth along the sound shoals.

Below is comparative data on both impoundments for the same months in 1958 and 1959.

Staff Gauge Readings

End of Month	North Pond		South Pond	
	1958	1959	1958	1959
May -	4.40	4.20	4.20	3.98
June -	4.34	3.80	4.42	3.30
July -	3.60	4.24	3.68	4.10
August -	4.12	4.06	4.20	3.66

2. Food and Cover

Available food supply for the wildlife species which inhabit Pea Island Refuge is not an important factor during the summer months. There is, of course, an abundance of foods during these months. Cover was adequate for the nesting population of black ducks, gadwalls, and blue-winged teal. Ring-necked pheasants, shore-birds, and wading birds also found adequate food and cover.

At this time, the outlook for the coming wintering season is good. Submergent vegetation on the shoals in Pamlico Sound

2. Food and Cover - Continued

has made a good summer growth and coverage is good. Spartina alterniflora, favorite food of the snow goose at Pea Island, continues to spread on the south and north flats. The north pond has good supplies of submergent aquatics and the south pond is fair to poor. Good growths of smartweed, three-square, and patches of wild millet are common in the fresh marshes. The 25 acres planted to Japanese and brown-top millet along the east side of the south pond has made fair growth. Reasonably good seed production is expected.

On the opposite side of the ledger, beach pea is less abundant than last year. Possibly, this will be offset by the good growths of emergent aquatics within the impoundments.

II. WILDLIFE

A. Migratory Birds

1. Waterfowl

About 100 Canada geese were seen on the refuge until the middle of May. None remained for the summer as has been the case in the past.

Brood counts of the ducks nesting locally indicate that the gadwalls decreased, the black ducks increased slightly, and the blue-winged teal increased noticeably. This is relative to the 1958 nesting season. Three broods of blue-winged teal were seen in '58 whereas 22 broods were counted this year.

Detailed information on the nesting population of ducks will be found in a special Student Assistant Report for the summer of 1959.

2. Wading Birds, Gulls, Terns, and Shorebirds

The use of the heron and egret rookery increased over last year. All of the seven species using this rookery increased. These include little blue herons, Louisiana herons, black-crowned night herons, yellow-crowned night herons, American egrets, snowy egrets, and the glossy ibis. The most noticeable increase was in the glossy ibis which increased from 8 nests in 1958 to 24 nests this year.

The gulls and terns were abundant this summer. Most abundant during the summer was the laughing gull. Common, royal, and least terns were seen regularly. Willets commonly fussed about any intrusion along the roads around the ponds.

B. Upland Game Birds

Ring-necked pheasants are on the increase on the refuge. They are seen often while making trips around the impoundments. Three broods were seen while the birds were small. Two were within the impoundments and one was in the upper salt marsh between the two impoundments. The estimated total of these birds on the refuge at the close of this period is forty.

C. Fur Animals, Predators, Rodents, and Other Mammals

During the summer, a survey of muskrat population and use on the refuge was made by the student assistant. This survey indicates a muskrat population of about 2000 on the refuge. This figure is somewhat less than had previously been estimated. A detailed report of this survey will be found in a special student assistant report for the summer of 1959.

Otter have been seen during the summer, although not with the regularity of winter-time observations. Some nutria remain at large on the refuge; a few remain in each impoundment. Tracks indicate that a few mink are also on the refuge.

D. Hawks, Eagles, and Crows

The refuge was practically devoid of hawks and eagles this summer. One bald eagle was seen in the latter part of the summer, but it did not linger on the refuge. Afew crows were on the refuge most of the summer; there were up to 25 seen on a days trip around the refuge.

E. Other Birds

The American avocet and the black-necked stilts are becoming more common. Forester's tern was also seen several times. House sparrows were seen this summer for the first record on the refuge. It is definitely known that none have been seen before this summer at field headquarters for the last ten years.

F. Fish

No fresh water game fish are found on the refuge. Salt water fishing along the 12 mile ocean front and at Oregon Inlet has been only fair this summer. Good strings of bluefish were caught during May and June while the bluefish were moving north. Since that time the fish catches have consisted of flounder, whiting, croakers, and weakfish with lesser numbers of other species.

H. Reptiles

Common water snakes, black snakes, and spreading adders are common on the refuge. They are of little significance.

Snapping turtles do exist in the impoundments. They possibly prey on some ducklings and young muskrat. However, their presence is of limited significance.

I. Diseases

No diseased animals have been observed. An occasional muskrat is found dead, but this is probably due to the normal expiration.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. About 100 feet of bulkhead was built around a badly eroded portion of the dike in the north pond.
2. A section of the road right-of-way line in the north pond was fenced.
3. A well was driven and a pitcher pump was installed inside the patrol cabin. Repairs and a repaint job inside the cabin was begun.
4. Bulldozed around telephone poles in the north pond and cut a fire line. This was followed by burning and plowing under a lush stand of wax myrtles and locust.
5. Fire lines were plowed out.
6. Jeep roads around both impoundments were mowed.
7. Our Kohler light plant had a factory rebuild job. A replacement light plant was borrowed from the NPS.
8. Window screens and screen doors in residence 1 were replaced.
9. Performed spraying operations for cattail control on scattered patches.
10. All fire extinguishers were replaced to conform with regional office recommendations.
11. Preventative maintenance and repairs have been made to vehicles and tractors.
12. Other minor maintenance has been accomplished including painting doors and trim at headquarters, replacing outside trash cans, replacing rotten windows, etc.

B. Plantings - Cultivated Crops

About 5 acres was planted to brown-top millet and 20 acres to Jap millet. This was completed at the first of August. A third of the field was disked three times and the other two-thirds got two diskings. 300 pounds per acre of 8-8-8 fertilizer was applied.

B. Plantings - Cultivated Crops - Continued

Approximately 35 pounds of seed were broad-cast. Germination was good. At this time the heads are near maturity, but the seeds have not begun to harden. Considering the poor soil, a reasonably good production of seed appears to be in the making. Close observations will be made to evaluate the success of both Japanese and brown-top millet for fall seed crops at Pea Island.

C. Collections and Receipts

None.

D. Control of Vegetation

Mechanical control by dozing and plowing was accomplished on an area of large wax myrtle and locust along the east side of the north pond. With another years work this area should be in good shape.

Herbicidal control will be reported on in the narrative report ending in December.

E. Planned Burning

None for this period.

F. Fires

As stated previously, the carbon tet fire extinguishers were replaced. This required an almost complete set of fire extinguishers since most of those previously on hand were carbon tet.

One wildfire occurred along side the highway. It was beaten down before it had gone more than a few feet. The probable cause was a cigarette thrown from a car. The road shoulders are grassing up, and this may gradually become a greater hazard as years go by.

IV. RESOURCES MANAGEMENT

A. Commercial Fishing

Ocean fishing crews fished in May with intermittent luck. Since that time no commercial fishing has been observed from the beach. No permits are required for commercial fishing in salt water.

B. Concessions

The Pea Island Campground Store located on the north end of Pea Island Refuge is the only concession. Receipts from this concession are handled by the National Park Service and payments are forwarded directly to our Regional Office.

V. FIELD INVESTIGATION

Pea Island Refuge was fortunate to have a summer student assistant this year. In addition to regular duties, he made investigations on the nesting duck population, muskrat activity and population, and a hurried survey of aquatic vegetation on the shoals in Pamlico Sound. A detailed report on these investigations will be completed on September 9; one copy will be kept on file at the refuge and one submitted to the Regional Office.

VI. PUBLIC RELATIONS

A. Recreational Uses

Fishing activity was high during the summer months. Some swimming, bird watching, and just plain sight-seeing were other uses made of the refuge

An indication of the number of vacationers passing through the refuge can be illustrated by an observation made on one Sunday afternoon. On August 23 at 4:00 P.M. there were 83 cars in line on the south side of Oregon Inlet waiting to cross on the ferry. Traffic has been heavy throughout most of the vacation season.

B. Refuge Visitors

1. Registered Visitors

Visitor registers at Field Headquarters for this period shows a total of 1424 registered visitors. This is a slight increase over registered visitors in the same period last year.

2. Official Visitors

Name and Orginazition	Date	Address
Mr. Earl Hampton, FWS, R.O.	5/14	Atlanta, Ga.
Mr. Milford K. Thurber, FWS. R.O.	5/14	Atlanta, Ga.
Dr. Tinker, Public Health Service	Several Dates	Atlanta, Ga.
Mr. Victor Kay, FWS, R.O.	6/19	Atlanta, Ga.
Mr. Ted Ball, FWS, R.O.	6/19	Atlanta, Ga.
Mr. Gus Hultman, NPS, Chief Ranger	7/9	Manteo, N. C.
Mr. Paul Springer, FWS	8/12	Patuxent Refuge

C. Refuge Participation

This station was glad to have an opportunity to participate in answering a conservation education questionnaire from the Commissioner's Office. Full efforts were made to acquire the public's feeling on this matter.

On May 23 several troops of Boy Scouts from the Hampton, Virginia area visited the refuge - there were 420 boy scouts and leaders. In three separate groups, a talk was given on National Wildlife Refuges. For each group a demonstration of cannon net operation including firing was included as part of the activities on their Hatteras Trail Expedition.

The manager attended a radiological training course held at Mattamuskeet Refuge on August 17 and 18. This was in connection with the Civil Defense Training sponsered by the Department of the Interior.

Refuge leaflets were distributed to all of the motels and hotels on Hatteras Island.

D. Violations

No cases were made during this period.

VII. OTHER ITEMS

A. Summer Student Assistant

Pea Island Refuge was alloted a student assistant for the first time this summer. The position was filled by Mr. James F. Parnell, student at N. C. State College, Raleigh. He entered on duty June 8 and will be separated on September 9. He has performed worthwhile services while attached to Pea Island.

B. Adminstrative Office

The official headquarters office for Pea Island Refuge was moved on July 1, 1959. Previously, the office was in the Fort Raleigh Hotel building. The refuge office is now located on the second floor of the Evans Building. A sidewalk plaque reading "PEA ISLAND NATIONAL WILDLIFE REFUGE" has been placed at the entrance stairway. Also, proper designation has been placed on the office door.

C. Oregon Inlet Bridge

On June 26 news was released that the State of North Carolina has authorized construction of a bridge to cross Oregon Inlet. Actual construction will be delayed pending the stabilization of a channel through the inlet by the Army Engineers.

D. Modern Toilet Facility

Under permit, the N. C. State Highway Commission has completed a new toilet facility at the ferry landing on the north end of Pea Island Refuge. The water system is operated through electricity derived from an automatic generating plant.

E. Equipment Replacements

Major equipment obtained this period includes a new manual typewriter, a new 10 horse Johnson outboard motor, and a surplus electric adding machine.

F. Photographs

On the following pages please find snapshots pertaining to the refuge.

Date submitted: September 17, 1959

Respectfully submitted,

Approved: _____

Charles F. Noble

Charles F. Noble
Refuge Manager

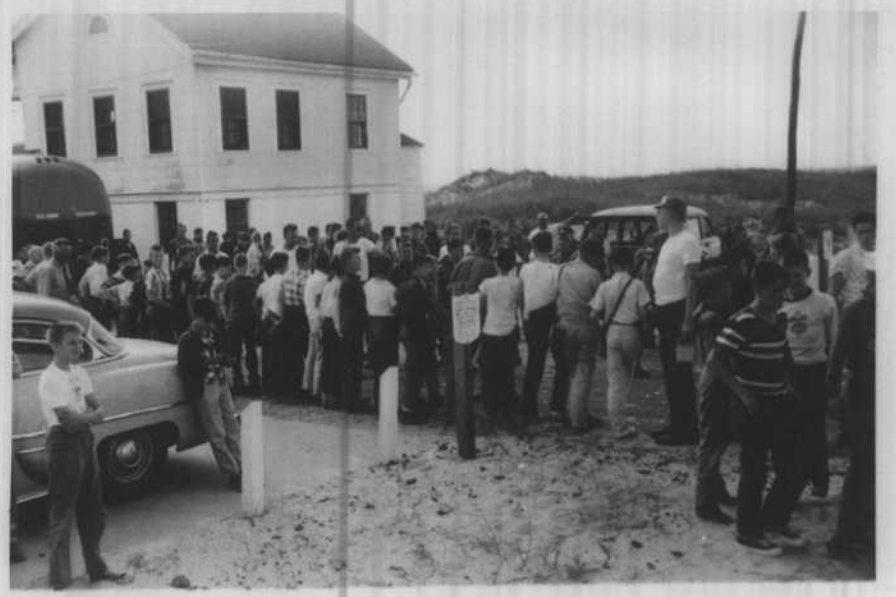
_____

Keeping fire lanes open by plowing.

Dozing and plowing a dense stand of large wax myrtle.

Bulkhead to stop erosion of a dike. On page 13 of the previous narrative report there is a picture taken at the same place last winter.

Millet planting operations within the south pond.



Part of the 420 Boy Scouts who visited the refuge on a Hatteras Trail Expedition.

New toilet facilities built at the ferry landing by the N. C. Highway Commission. Previous narrative report shows pit toilets which were being used at this location.

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

WATERFOWL

REFUGE Pea Island Refuge

MONTHS OF May 1 TO August 31, 1959

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	100	100	100							
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard										
Black	250	300	350	350	400	450	450	450	450	400
Gadwall	200	300	350	350	350	375	400	600	700	650
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal	30	20	60	60	60	60	100	125	150	150
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup						1	1			
Goldeneye										
Bufflehead										
Ruddy										
Other										
Red-breasted Merganser	50	50								
Coot:	20	20	20			2	2	2	2	

Int. Dup. Sec.,
Wash., D. C. 37900

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Pea Island Refuge MONTHS OF May 1 TO August 31, 19 59

(1) Species	(2) Weeks of reporting period 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production Broods seen	Estimate total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada									1,600		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard				1	1	1	1	1	35		
Black	400	300	150	100	100	150	200	250	37,750	48	300
Gadwall	600	600	550	400	200	200	300	400	52,475	51	390
Baldpate											
Pintail											
Green-winged teal				2	2	2			42		
Blue-winged teal	150	150	100	50	50	150	200	300	14,185	22	115
Cinnamon teal											
Shoveler											
Wood											
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Red-breasted Merganser									450		
Coot:									376		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	1,600	100	
Ducks	104,937	1300	805
Coots	376	20	

SUMMARY

Principal feeding areas Fresh water impoundments

Principal nesting areas Dikes and islands in impoundments for gadwall and bluewing; entire refuge for blacks.

Reported by Charles F. Noble, Refuge Manager

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).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Pea Island Refuge Months of May 1 to August 31 1959

(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	Estimate Number
I. Water and Marsh Birds:										
Herons, Little blue		5/1	180	6/20			1	38	102	250
" , Louisiana		5/1	220	6/20			1	47	130	300
" , Black-crowned Night		5/1	270	6/20			1	56	155	450
" , Yellow-crowned Night		5/1	15	7/26			1	2	5	20
Egrets, Common		5/1	150	6/20			1	28	80	200
" , Snowy		5/1	570	6/20			1	115	340	700
Bitterns, American					1	5/10				30
Rails, Clapper	Resident									200
Ibis, Glossy		5/1	110	6/20			1	24	70	120
II. Shorebirds, Gulls and Terns:										
Gulls, Black-backed			20	5/1						30
" , Herring			800	5/1						1000
" , Ring-billed			600	5/1						800
" , Laughing			4000	7/18						5000
Terns, Common			700	6/20						1000
" , Royal			200	6/20						300
" , Least			700	6/20						1000
" , Forsters			20	8/12						40
Skimmers, Black			300	7/18						500
Willets			350	7/18						600
Yellow-legs, Great. & Less.			600	7/18						800
Sandpipers, all species			6000	6/20						8000

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:										
Mourning dove	Occasional bird seen.									
White-winged dove										
IV. Predaceous Birds:										
~~Golden eagle~~										
Duck hawk										
Horned owl										
Magpie										
Raven										
Crow										
Osprey	8/24	1								3

Reported by.....

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 Gruiiformes
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.

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Pea Island Refuge — For 12-month period ending August 31, 1959

Reported by Charles F. Noble — Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage		(3) Use-days	(4) Breeding Population	(5) Production
Area No. 1, all cropland, two fields	Crops	62	Ducks	19,950		
	Upland		Geese	274,260		
	Marsh		Swans			
	Water		Coots			
	Total	62	Total	294,210		
Area No. 2, all upland, dikes and sand dunes	Crops		Ducks			
	Upland	2,652	Geese	68,565		
	Marsh		Swans			
	Water		Coots			
	Total	2,652	Total	68,565		
Area No. 3, all low lying marsh and sand flats	Crops		Ducks	498,778	660	805
	Upland		Geese	205,699		
	Marsh	6,181	Swans			
	Water		Coots			
	Total	6,181	Total	704,477	660	805
Area No. 4, all waters including Pamlico Sound	Crops		Ducks	478,828		
	Upland		Geese	822,777		
	Marsh		Swans	15,540		
	Water	19,000	Coots	60,592		
	Total		Total	1,377,737		
	Totals	25,282		2,444,985	660	805
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.

(5) **Production:** Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Pea Island Refuge Months of May 1 to August 31, 1959

(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'v'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 growths, and marshes		3	8					40	Little data available

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.

PEA ISLAND NATIONAL WILDLIFE REFUGE

Narrative Report for the Period January 1 through April 30, 1959

Table of Contents

PEA ISLAND NATIONAL WILDLIFE REFUGE

REFUGE NARRATIVE REPORT

January 1 through April 30, 1959

Charles F. Noble, Refuge Manager
Houston C. Phillips, Refuge Aid

I. GENERAL

A. Weather Conditions

Relatively typical weather prevailed this report period. Eleven north-easters have occurred; this may be a few above normal for the late winter period, but generally north-east winds are expected during these months. Most of these were not severe. The most severe lasted seven days during the last of February and first of March. During this north-easter the strongest winds recorded were 41 miles per hour on March 2.

Since the latter part of January extremely cold periods have been few. The temperature fell below freezing thirteen days in January with the low of 17 degrees recorded on January 6. Only five freezing temperatures were recorded in February. Temperature was in the 30's often in the first half of March. The lowest temperature in April was 41 degrees. The high temperature for the period was 82 degrees recorded on April 20.

Rainfall for the period was 2.16 inches above the five year normal and 1.33 inches above that of the same period last year. Precipitation for January and February was slightly below normal while March was 2.24 inches above normal and April was 0.60 inches above average rainfall.

Listed below is the weather data furnished us by the National Park Service from their official weather station located on Bodie Island. The data was recorded only three miles north of the refuge and reflects weather conditions on the refuge. Figures used for normal precipitation are the averages for the five year period which this weather station has been in existence.

A. Weather Conditions - Continued

Month	Precipitation			Temperatures	
	This Month	Normal	Dev. from Normal	Max.	Min.
January -	2.95	3.26	-0.31	66	17
February -	3.64	4.01	-0.37	65	26
March -	6.27	4.03	+2.24	72	31
April -	2.89	2.29	+0.60	82	41
Totals -	15.75	13.59	+2.16	Extremes- 82	17

B. Habitat Conditions

1. Water Conditions

Favorable water conditions have existed to permit waterfowl to utilize the impounded areas. Staff gauge readings up to 5.00 were recorded all four months on the north pond. Gauge readings up to 5.00 were recorded in January, February, and March in the south pond.

Rains inundated many acres if salt marsh periodically. The few inches of water covering these marshes provided ideal feeding conditions for ducks and geese.

In late winter Pamlico Sound tides continued to remain low, providing shoal feeding for Canada geese well off-shore.

Following are staff gauge readings giving comparative data on the two fresh water impoundments.

Staff Gauge Readings

End of Month	North Pond		South Pond	
	1958	1959	1958	1959
January -	5.04	4.82	5.16	4.86
February -	5.00	4.88	5.04	4.80
March -	5.10	4.92	4.90	4.82
April -	4.80	4.86	4.78	4.60

2. Food and Cover

Waterfowl foods were considered to be more abundant than in several previous years. This accounts for the good condition in which the birds appeared to be throughout the winter. Abundant foods may account for the low mortality among geese this year; only five birds were found dead during the late winter months when die-offs are possible.

The ryegrass field has paid dividends. Though kept browsed short, the field has remained green. With a few warm days the plants would grow rapidly. Many times 2000 geese could be seen browsing on the sixty acre field. We hope to extend this field southward to include a few more acres since a pasture type management for ryegrass appears to be the most satisfactory yet tried.

The 20 acre Jap millet field and adjoining marsh were well used. This field contained ponded water most of the winter and provided ideal conditions for puddling.

As indicated by use, submergent aquatics on the shoal areas in Pamlico Sound provided good food sources until late February. Many thousand geese used these areas most of the winter.

After each rain, the salt marshes were used by ducks and geese. Water was pocketed in these marshes allowing puddle ducks to work the areas for food.

Near the last of February, geese began to cover the dikes and dunes for beach peas. Some beach pea patches were untouched when most of the wintering population had left.

II. WILDLIFE

A. Migratory Birds

The annual waterfowl inventory was made from January 16 through 18. Due to unusually bad weather and strong winds, the ground census was not completed on the 16th; it was thought that conditions were adverse for the aerial portion of the census, and an effort was made to coordinate the two phases. However, the aerial census was made on Friday, January 16th. The ground census was made on the first succeeding day when desirable weather conditions prevailed; this was Sunday, January 18th. Data obtained did not correspond. It is believed that on the day of the aerial census the type of weather prevailed which drives birds in from the surrounding open water areas of

A. Migratory Birds - Continued

Pamlico Sound. The following day many of these birds probably moved off the refuge. The game management agents counted 11,050 ducks and 11,800 geese. Refuge personnel counted 2,833 ducks and 7,669 geese from the ground. The total tabulation of birds counted by the game management agents was 23,125 as compared to 11,473 counted from the ground. By aerial census a flock of 4,500 redhead were seen; this flock was not located by refuge personnel. Since conditions for observation from ground level are poorest on open water areas during bad, windy weather, it is quite possible that Pea Island provides resting and feeding for many birds during storms which go unobserved.

Soon after the waterfowl hunting season had ended, birds began spreading out into surrounding areas. Canada geese and snow geese moved between the marshes north of Oregon Inlet and the refuge. Snow geese remained in the marshes north of Oregon Inlet some two or three weeks after leaving the refuge. By the end of April all birds had left the refuge land area except an estimated 100 Canada geese and 400 ducks. The remaining Canada geese used the ryegrass field exclusively.

The larger flocks of snow geese used the refuge about two weeks later than normal. It was mid-January before the birds began to leave Pea Island. The peak population of 8200 Canada geese for the period was 500 below the peak for the same period last year. Black ducks were more abundant than in the previous year, but diving ducks were not seen in large numbers at any time during the wintering season. Very few scaup and redhead used the fresh water impoundments.

Mergansers and cormorants have been common near Oregon Inlet since late winter. Cormorants make black islands of the exposed sand shoals in Oregon Inlet. Flights of mergansers continue between the ocean and the Pamlico Sound for two hours, another flock coming in view as the flock just passed continue on out of eyesight or stool within view.

By mid-April egrets and herons were arriving on the rookery in south pond. Snowy egrets, black-crowned, Louisiana, and little blue herons were abundant. Glossy ibis had increased over the number using the rookery in 1958; twelve were seen on the refuge on April 28. Egrets and herons were still arriving at the end of the period.

B. Upland Game Birds

Ring-necked pheasants are seen in wax myrtle growths both within and outside the impoundments. They also use the dikes of the south pond regularly.

C. Fur Animals, Predators, Rodents, and Other Mammals

The most abundant fur-bearer on the refuge is the muskrat. Muskrat are seen on practically all trips around the ponds. Their tunnels and tracks cover the refuge. The estimated population of this species is 3000.

Otter are seen occasionally. Their trails are found where they cross the dikes regularly moving to and from the fresh water impoundments and the tidewater creeks along the sound shore.

One nutria was seen in the north pond in April. No doubt, there are others on the refuge, but the eradication work done on this species has been evident in the few sight records in recent months.

D. Hawks and Eagles

Marsh hawks and duck hawks are seen on the refuge during the winter. Osprey were seen over the marshes in the latter part of March.

One to three bald eagles could be seen on occasion during the winter months. One was seen harassing the flock of snow geese feeding in the salt marsh between the two impoundments. The presence of an eagle disturbed these geese and kept them moving as long as the eagle remained in the vicinity.

E. Fish

Commercial and sport fishermen had little success in their endeavors this four month period. A few stripped bass were caught near Oregon Inlet by commercial fishermen. Sport fishermen reported no catches along the ocean front.

F. Diseases

No waterfowl die-offs occurred on Pea Island this winter. During routine trips over the refuge and walks in the marshes only five dead Canada geese were found. Four were found in the latter part of January and one in February.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Development Projects

An underground gasoline tank and 10 gallon visible hand

1. Development Projects - Continued

pump were installed to replace the old, rusted tank that was on a framework above-ground. This is an improvement since the old tank required filling cans to measure withdrawals whereas the visible type hand-pump allows direct filling of vehicle tanks.

2. Maintenance

Preventive maintenance has been done on all vehicles, light plants, gasoline water pump, gasoline engine air compressor, and D-4 tractor. A new gate was placed in the fenceline for access near the south dike of the north pond. Roofs were patched where shingles broke during storms. Screen doors were repaired and replaced. Putty was replaced in a portion of the windows. Waterfowl trapping equipment was repaired as necessary upon completion of the trapping season.

B. Plantings

No planting or transplanting of marsh, aquatic, or cultivated plants was done during the winter months.

C. Collections and Receipts

No collections were made.

D. Control of Vegetation

No control measures, either herbicidal or mechanical, was done this period.

E. Planned Burning

Fire lanes were plowed out on the two small units scheduled for burning. Wind and water conditions did not prevail to expect a good burn, so burning was withheld. Waterfowl foods were abundant this year; litter had not collected on the two units to expect the best of burns, and it is fortunate that we have these areas to rely on next winter in case the natural food production is low. Only 120 acres were scheduled for burning this year; both units are located on some of the poorer marshes.

F. Fires

No wildfires have occurred on the refuge during the last four months.

IV. RESOURCES MANAGEMENT

A. Concessions

The concession located at Oregon Inlet is under permit from the National Park Service. Agreements concerning revenue are handled on the regional office level.

B. Commercial Fishing

Two crews operating along the ocean front with long nets had caught only a few hundred pounds of fish by the end of April. Some oystering and crabbing is done on the Pamlico Sound side of the refuge. No commercial fishing in the salt water portions of the refuge requires permits.

V. FIELD INVESTIGATION AND APPLIED RESEARCH

Field investigation consisted of the weekly waterfowl counts and dead bird searches. No research program exists on the refuge at the present time.

The waterfowl trapping program was continued. The results were poor, probably due to two conditions. Canada geese did not suffer for food this year. Therefore, efforts to get them to come on baited areas were of little avail. Not more than six or eight would feed at the cannon net sites. Ducks did not use the fresh water impoundments as much as in previous years. The population of diving ducks using the ponds was about 400 at the peak.

The following is the results of the duck trapping program: Forty one coots were banded; three returns taken in previous years were trapped. Thirty black ducks were banded; one recovery of a black duck banded at another station was made. Three mallards and two ring-necked ducks were banded.

VI. PUBLIC RELATIONS

A. Recreational Uses

As previously stated, the use of the refuge for sport fishing this period was very low. Recreational uses are usually limited to the warm weather months and early fall.

B. Refuge Visitors

1. Registered Visitors

132 visitors registered in the field headquarters office. This compares with 57 for the same four month period last year.

2. Tabulated Traffic Through The Refuge

Figures listed below are compiled from data furnished us by the National Park Service who maintain automatic traffic counters at Oregon Inlet.

Months	Vehicles	Passengers
January	2,690	7,532
February	1,490	4,768
March	3,664	10,259
April	5,176	17,595
Totals -	13,020	40,157

Data above shows an increase in travel through the refuge of 35.3% over that of the same period last year

3. Official Visitors

Noted below are official visitors to the refuge during the period January 1 to April 30, 1959.

Name and Orginazition	Date	Address
Mr. L. S. Givens, FWS, Regional Office	3/15	Atlanta, Ga.
Mr. Eugene Crawford, FWS, Central Off.	3/15	Washington, D. C.
Dr. T. L. Quay, N.C. State College	3/26	Raleigh, N. C.
Mr. E. B. Garret, Head, SCS in N. C.	4/22	Raleigh, N. C.

C. Refuge Participation

On January 15, the manager gave the program for the monthly meeting of the Roanoke Island Garden Club. A short talk on refuges and the refuge program was followed by the showing of a series of 35 mm slides on refuge management and birds.

A program for the Sea Scouts of Manteo and their leaders was arranged by the manager for February 7. This consisted of a short talk on the role of conservation, field trip over the refuge explaining conservation practices, and participation in the banding and release of ducks and coots for the day.

C. Refuge Participation - Continued

The manager attended the Regional Conference in Athens, Georgia the week of February 21 - 28.

Refuge Aid Phillips conducted a tour over the refuge on February 28 for thirteen wildlife management students attending North Carolina State College.

The manager attended a correspondence workshop with major staff members of the Cape Hatteras National Seashore Recreational Area upon invitation from Park Superintendent Gibbs. The full-day was devoted to the 4-S formula for writing plain letters. It was held on March 13 in the Visitor Center at Bodie Island.

Other tours of the refuge were conducted upon request by interested parties when time permitted.

F. Violations

No cases were made this period. Cooperation on patrol of the refuge was received from the local N. C. Wildlife Protector, Mr. Wade Register.

VII. OTHER ITEMS

A. New Equipment

A Chevrolet sedan delivery was picked up in Baltimore to substitute for the Dodge pick-up which was in poor condition. A Caterpillar D-4 tiltdozer was picked up at Blackwater Refuge; this item was Army surplus, but appears to be in fair shape.

B. Office Development

Action has been taken to change the administrative office to a more desirable location. This should develop in the near future.

C. Proposed Modern Toilet

The North Carolina Highway Commission has requested authority to build a modern toilet facility on the north tip of Pea Island near the ferry landing. Proper action has been taken on the request. If authorized, the proposed facility should alleviate an existent need.

D. Wreck of the Ralph Eugene

A fishing vessel, the Ralph Eugene of Englehard, North Carolina, owned by Mr. Harry Jarvis of Englehard, ran ashore three miles south of Pea Island Refuge Field Headquarters at 4:00 A.M. on April 8, 1959. The 53 foot trawler was skippered by F. W. Sears. Eight boxes(800 lbs.) of fish were aboard. Foggy conditions prevailed and the cause of the wreck was attributed to a defective compass. No injuries were reported.

On April 10, under request by the owner, the U. S. Coast Guard had their tug pull the wrecked trawler off the beach. The strain was too much for the hull and it cracked. It took on water and pumping efforts were useless. The trawler capsized and sank about 1/2 mile offshore.

E. Photographic Equipment

In April an Argus C-3 camera and Argus 500 watt projector were purchased for the refuge. This should be an extremely worthwhile addition to the refuge equipment. The refuge staff will start a series of color slides on the refuge to use in public relations programs in the future.

F. Photographs

Pictures pertaining to the refuge will be found on the following pages.

Date submitted: May 15, 1959 Respectfully submitted,

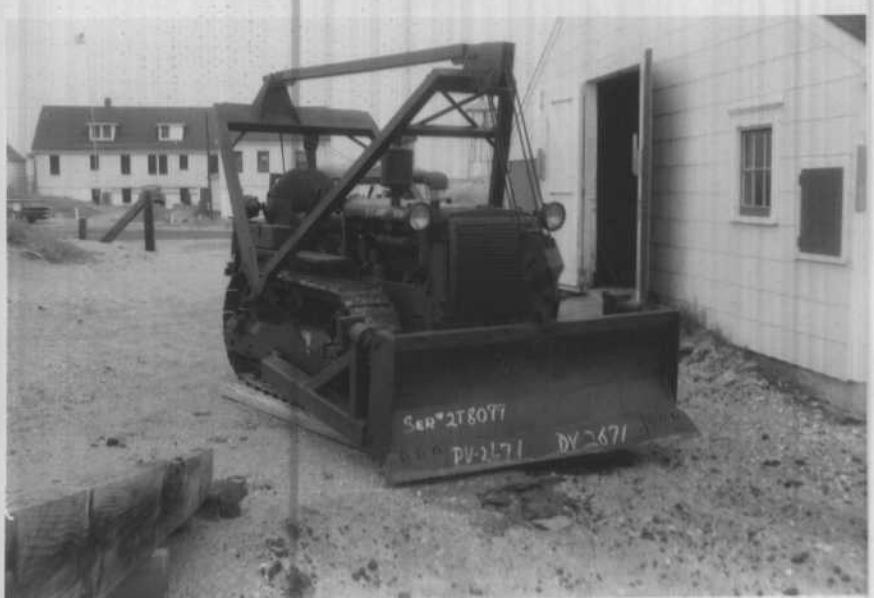
Approved: Lawrence A. Gracie Charles F. Noble

Regional Refuge Supervisor

May 19, 1959

Charles F. Noble
Refuge Manager

The trawler, Ralph Eugene, was wrecked on Pea Island Refuge.



MAY 1959

The Army surplus D-4 dozer added to refuge equipment.

Pit toilets presently located near the ferry landing on the south side of Oregon Inlet.

The public toilets located on the north side of Oregon Inlet. This is the type of building the N. C. Highway Comm. has requested to build to replace the pit toilets above.

MAY 1959

Erosion along the south dike of the north pond. Picture above shows the worst place in the dike.

MAY 1959

Asbestos shingles blew up and broke off during northeasters. Picture shows patching work done.

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

WATERFOWL

REFUGE Pea Island Refuge MONTHS OF January 1 TO April 30, 19 59

(1) Species	(2) Weeks of reporting period 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling	84	198	110	120	125	85	95	105	67	64
Trumpeter										
Geese:										
Canada	8200	6800	7200	7700	7500	7200	6600	6800	5600	4200
Cackling										
Brant										
White-fronted										
Snow	7400	7200	3600	900	200	100	40			
Blue	12	8	2			8	8	4		
Other										
Ducks:										
Mallard	45	20	80	80	75	60	20	15	6	
Black	1050	1000	1100	1600	1400	1000	900	800	600	550
Gadwall	200	200	300	350	350	250	250	250	250	250
Baldpate	750	1000	820	700	300	300	250	150	50	10
Pintail	1350	800	460	600	700	400	300	250	75	100
Green-winged teal	300	250	370	380	350	275	300	300	200	125
Blue-winged teal										
Cinnamon teal										
Shoveler	120	150	90	110	90	80	60	20	20	5
Wood										
Redhead	225	225	20	200	150	300	25			
Ring-necked	75	25				20	15	10	10	10
Canvasback	20			4	2		1	1		
Scaup	175	100	40	75	50	40	30	20	10	10
Goldeneye										
Bufflehead	850	600	500	400	200	200	200	150	150	100
Ruddy	160	150	75	50	50	60	40	40	15	10
Other										
Red-breasted Merganser						2000	1500		400	
Unidentified	400	500	400	700	300	200	200	100	150	100
Coot:	350	300	270	270	160		200	200	60	110

Int. Dup. Sec.,
Wash., D. C. 37966

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE **Pea Island Refuge** MONTHS OF **January 1** TO **April 30**, 19**59**

(1) Species	(2) Weeks of reporting period: 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Broods: Estimated total
Swans:											
Whistling	36	38	17	14	3				7,791	No production this period for any species.	
Trumpeter											
Geese:											
Canada	1500	1100	500	450	250	100	100	100	470,300		
Cackling											
Brant											
White-fronted											
Snow	1								106,487		
Blue	1								253		
Other											
Ducks:											
Mallard	12	8	10	12	6	2			2,977		
Black	700	500	300	300	250	200	150	150	83,350		
Gadwall	200	200	200	300	250	200	200	200	29,600		
Baldpate	60	40	20	10	10	10			28,360		
Pintail	125	100	20	30	5				31,805		
Green-winged teal	75	50	40	60	50	10			20,745		
Blue-winged teal			60	110	150	120	90	50	3,980		
Cinnamon teal											
Shoveler	8	8	6						4,889		
Wood											
Redhead									7,115		
Ring-necked	15	15	5						1,100		
Canvasback									116		
Scaup	5		2	4	2				2,941		
Goldeneye											
Bufflehead	70	20	10	10					20,820		
Ruddy	10	4	6	10	2				4,134		
Other											
Red-breasted Merganser	500	300	250	200	250	300	100	50	40,850		
Unidentified	70	50	25	25	30				21,150		
Coot:	90	80	70	60	60	60	( )	20	16,760		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	7,791	198	None
Geese	577,040	15,612	None
Ducks	303,912	5,720	None
Coots	16,760	550	None

SUMMARY

Principal feeding areas Pamlico Sound shoals, ryegrass and millet fields, two fresh water impoundments, salt marsh, dikes, and beach dunes.

Principal nesting areas No nesting this period

Reported by Charles F. Noble, Refuge Manager

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).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Pea Island Months of January 1 to April 30 1950

(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	Estimate Number
I. Water and Marsh Birds:										
herons, Little Blue	4	1/18	28	4/28						40
" , Louisiana	8	1/18	37	4/28						60
" , Black Crowned	6	1/18	46	4/28						70
egrets, Common	1	1/18	16	4/28						45
" , Snowy	16	1/18	94	4/28						150
bitterns, American	1	1/16	2	4/28						25
" , least	1	4/28	1	4/28						3
loons, Common	2	1/1	60	4/28						100
grebes, Pied-billed	4	1/1	56	1/18						150
cormorants, Double-crested	300	3/5	5000	March						3000
rails, Clapper	No accurate data.									200
ibis, Glossy	2	4/15	12	4/28						16
II. Shorebirds, Gulls and Terns:										
gulls, Black-backed	200	1/1	600	3/5						900
" , Herring	Res.		4000	3/5						5000
" , Ring-billed	Res.		5000	3/5						6000
" , Laughing	600	3/5	2000	4/28						3000
terns, Common	200	4/17	500	4/28						700
" , Royal	6	4/7	75	4/28						150
" , Least	4	4/7	45	4/28						100
yellow-legs, Greet & Less.	Res.		300	4/28						500
plovers, Wilson	4	4/7	60	4/28						200
" , Black-bellied	2	1/18	20	4/28						50
willets	30	4/7	80	4/28						250
curlews, Hudsonian	1	4/7	2	4/28						6
sandpipers, All Species			2000	4/28						4000

(over)

(1)	(2)		(3)		(4)	(5)	(6)
III. Doves and Pigeons:							
Mourning dove		April	10	April			
White-winged dove						Transient	
IV. Predaceous Birds:							
Golden eagle							
Duck hawk	2	1/18	1	4/7			
Horned owl						About 6 present in winter	
Magpie							
Raven							
Crow							

Reported by Charles F. Noble

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 Gruiiformes
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.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Pea Island Months of January 1 to April 30, 1959

(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'v'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 growths, and fresh marsh	-	-	-	-	-	-	-	- 16	Relatively new species - little data has been obtained.

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 Year ending April 30, 1959

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Population
Muskrat	Cattail, Three-square, cordgrass, and grasses-1500 acres	Est.-0.05												Est. 3,000
Otter	Range over all of the land area and tidal creeks-5,880 acres	196												Est. 30
Nutria	Same as muskrat area listed above-1500 acres	100												Est. 15

* List removals by Predator Animal Hunter

REMARKS:

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 headingslisted.

(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 unprimeness 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.