

PEA ISLAND NATIONAL WILDLIFE REFUGE

Narrative Report for Period September 1 through December 31, 1960

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PEA ISLAND NATIONAL WILDLIFE REFUGE

REFUGE NARRATIVE REPORT

September 1 through December 31, 1960

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

I. GENERAL

A. Weather Conditions

Two important weather factors developed during this four month period. First was Hurricane Donna in September; then, there was the semi-drought conditions which prevailed throughout the fall months and up to the present time.

Hurricane Donna passed through Dare County (in which Pea Island Refuge is located) on Sunday night, September 11 and Monday morning, September 12. By noon on Monday the clouds were clearing and the sun broke through. But in 'her' path she had left devastating destruction. 'Her' winds were fierce enough, but it was the 'piling up' of water, causing flood conditions on all low lying areas that brought about the greatest property damage. The high water caused by 'Donna' crested around 6:00 A.M. in the Manteo area; these were the highest tides known in Manteo for at least 40 years. Sound waters swelled higher on the refuge than in any previous hurricanes in the 11 years Wildlife Aid Phillips has lived on the refuge. Winds were sufficient to cause much damage to buildings; 110 mile per hour winds were clocked on the Nags Head beach.

Semi-drought conditions have prevailed on the refuge for this four month period. This has had a tremendous affect on fall plant growth and waterfowl utilization of the marshes. For four months only 7.93 inches of rain fell. This is a deficiency from normal of 10.18 inches in these four months.

Winter 'came on' slowly, but with December just a few days old some real winter weather arrived. It remained through most of December. Snow came on December 12 and by the following day, December 13, the temperature had fallen low enough for the fresh water impoundments to freeze over. Strong north-west winds accompanied this cold air. The following day, the 14th, the temperature fell to 16 degrees on the ocean front, which feels extremely cold.

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.

<u>Month</u>	<u>Precipitation</u>			<u>Temperatures</u>	
	<u>This Month</u>	<u>Normal</u>	<u>Dev. from Normal</u>	<u>Max.</u>	<u>Min.</u>
Sept. -	2.70	6.96	- 4.26	94	64
Oct. -	0.93	4.80	- 3.87	84	42
Nov. -	2.20	3.03	- 0.83	74	35
Dec. -	2.10	3.32	- 1.22	65	16
Totals -	7.93 in.	18.11 in.	- 10.18	Extremes -	94 16
Precipitation for 1960 -				46.31 inches	
Average Normal Annual Precipitation -				<u>49.30 inches</u>	
Year 1960 Deviation from Normal -				- 2.99 inches	

B. Habitat Conditions

1. Water Conditions

Water levels in the North and South Ponds have been exceptionally low for late fall and early winter. A staff gauge reading of 3.90 was recorded on each pond on December 30. This produces a water level about one foot lower than is expected in mid-winter. Salt content of the water has been low, providing a fresh water habitat for all practical purposes.

The water conditions on the Pamlico Sound Proclamation Area have been satisfactory. High tides of Hurricane Donna did much less damage to the submerged aquatics than expected. Low water conditions often has allowed Canada geese to feed far out on the sound shoals.

At the top of the next page is a staff gauge reading table. Staff gauge readings entered were taken near the end of each month. Readings in 1959 and 1960 are provided for comparative purposes.

Staff Gauge Readings

<u>End of Month</u>	<u>North Pond</u>		<u>South Pond</u>	
	<u>1959</u>	<u>1960</u>	<u>1959</u>	<u>1960</u>
Sept. -	3.78	4.00	3.46	3.84
Oct. -	3.80	3.84	3.50	3.78
Nov. -	3.90	3.68	3.82	3.82
Dec. -	4.26	3.90	4.38	3.90

Water salinity tests were made in both the North and South Ponds at various times throughout the year. A summary of the results of these tests will be found in the table below.

Water Salinity Tests During Year 1960

(Readings in % of Sea Strength)

<u>Date</u>	<u>North Pond</u>		<u>South Pond</u>	
	<u>North End</u>	<u>At Staff Gauge</u>	<u>North End</u>	<u>At Foot Bridge</u>
1/27/60	1.2%	1.2%	1.0%	1.0%
3/29/60	0.88%	0.88%	0.88%	0.7%
5/24/60	1.2%	1.0%	1.2%	1.0%
7/1/60	1.06%	1.23%	1.23%	1.4%
9/28/60	1.76%	1.76%	1.94%	1.94%
11/25/60	2.1%	1.8%	2.3%	2.5%
12/30/60	2.1%	1.9%	2.5%	2.5%

2. Food and Cover

Available waterfowl foods are more critical this year than in recent years. After Hurricane Donna covered all of the refuge outside the impoundments except the ocean front sand dunes with salt water, many of the food sources were no longer available. Most of the beach pea crop, which produced abundantly this year, was destroyed. Inside the impoundments, water levels have been too low for water to cover the fresh marshes. Should future winter rains raise the water level, the impoundment marshes will provide a limited food source. The ryegrass browse crop has been the poorest for the last three years. The field received little rain in October when it was needed badly, and the effects are apparent.

It is doubtful that any burning units can be burned this year. To date, the salt deposited on plants during the hurricane along with the loss of litter or 'duff' to carry a fire makes marsh burning unsuccessful. Possibly, if heavy rains come to rinse the salt off plants, some might be accomplished later than normal.

Large patches of submerged aquatics remain on the Pamlico Sound shoals. On certain water conditions, this area will still provide a food source for the Canada goose flock.

II. WILDLIFE

A. Migratory Birds

Ducks began arriving, heralding the beginning of fall migration, in the third week of September. On September 13, there were 600 pintails, 800 blue-winged teal, and 400 black ducks on the North Pond. By the third week of October the fall migration was at its peak; pintail and widgeon which apparently travel farther south were concentrated on the North Pond. Approximately 2,000 of each of these species was present for a short time. The peak population came in the last week of December when a population of 6,475 was estimated on the refuge.

On October 3, the first Canada geese of the fall migration arrived. An estimated 500 were seen on the North Pond on this date. From 5,500 to 6,000 have used the refuge regularly since mid-November. A few snow geese began arriving with the first arrivals of Canada geese, but it was not until the second week in November that the influx of the major Dare County flock was noted. For short periods of time, more snow geese have been on Pea Island this winter than in any of the eleven winters Wildlife Aid Phillips has lived on Pea Island Refuge. On December 16, an estimated 12,000 were on the refuge. The snow goose flock in this area has definitely dispersed. Reports of large numbers have come from Hatteras. They have been seen regularly by the refuge staff coming from the south, past Rodanthe village. They have also used regularly north of Oregon Inlet almost to Whalebone junction.

The first whistling swan of the fall were seen on October 24. They increased rapidly to the peak population of 112 in the first week of November. They have shown a slight decline almost constantly since that week.

It is interesting to note that there was a tremendous increase in coots this year as compared to last year. From a peak population of 2,200, a constant decline in the refuge population has occurred until only an estimated 800 were present in the last week of December.

Some other interesting observations of non-game migratory birds were made. Hudsonian curlews and black-necked stilts were seen often in September and October. Glossy ibis were not seen after September 27. Though none have been seen on the refuge, it is interesting that at Bodie Island and near Buxton, several fulvous tree ducks have been seen this winter.

B. Upland Game Birds

The ring-necked pheasant has become common on the refuge. Some of these birds may have been destroyed by Hurricane Donna. Though seen quite often, the frequency with which they are seen has decreased since the passing of this devastating storm.

C. Fur Animals

Muskrat, otter, nutria, and an occasional mink inhabit the refuge. The only change from past records on these mammals is that there seems to be a decrease in the muskrat population using the South Pond. This is probably due to the reduction in cattails in this pond in recent years.

D. Hawks and Eagles

No bald eagles have been seen this winter. Marsh hawks, duck hawks, and sparrow hawks are seen during the winter months.

E. Fish

No fresh water game species are found on Pea Island Refuge. Surf fishing is common, but since there is no management for these fishes on the refuge, the sport fishing activity will be reported under the section on recreation.

F. Diseases

Many more sick and dead geese are being found at Pea Island this winter than in any of the last three winters. Considering habitat conditions this year, the higher disease rate can probably be attributed to malnutrition and excessive consumption of salt. 24 dead geese had been found through December 31 of this wintering season.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

On October 31, construction of 1900 feet of bulkhead was completed by refuge personnel. This was the major work project

during this period. The bulkhead is located inside the North Pond along the south shore and south-west corner of the pond. Photographs of this bulkhead will be found in the last pages of this report.

Hurricane Donna necessitated several items of maintenance. First, there was the cleanup of sand at all buildings, then window and door repairs. 13 miles of fence had to be cleared of debris, patched in many places, some posts replaced, and gates repaired. The refuge jeep roads had to be cleared of as much as 2 foot depths of debris including logs, drift wood, and grass. The patrol cabin was flooded by hurricane tide water, and a major cleaning job was necessary.

Other jobs were routine including maintenance to vehicles, light plants, tractors, farming equipment, and air cooled engines. The fill area behind the recently constructed bulkhead was leveled, graded, seeded, and fertilized. Plumbing and water tank repairs were accomplished at the residence. The annual project of farming 60 acres of goose browse crop was accomplished by refuge personnel.

B. Plantings - Cultivated Crops

Sixty acres of annual ryegrass was planted again this fall in the North Pond field. The field was mowed once in mid-summer and again prior to planting at the first of October. A close mowing was followed by seeding, fertilizing, and top dressing with ammonium nitrate except for 7 acres where sodium nitrate was used for top dressing. The purpose of this project is to produce a winter browse crop for Canada geese. Due to lack of rain for two months following planting, the browse crop was the poorest produced in the last three winters.

C. Collections and Receipts

None.

D. Control of Vegetation

No cattail spraying was undertaken this year. Patches of cattail are widely scattered and the plants are sparse. This pest plant should be held in check by spraying every other year as long as the encroachment is no greater than it was this year.

E. Planned Burning

Plans for marsh burning this year will have to be cancelled unless there is a change. So far, the marshes will not carry a fire. Heavy salt deposits were caused by Hurricane Donna, and the low

rainfall during the fall has not helped the situation. Hurricane flood waters lifted and moved most of the litter or 'duff' which is needed for marsh burning at Pea Island. Some may be tried later in the year if conditions look promising. If so, this will be reported in the narrative report for the period ending April 30.

F. Fires

The Pea Island Campground Store was completely destroyed by fire on the night of October 16, 1960. It was located at the Oregon Inlet ferry landing on the north end of Pea Island National Wildlife Refuge in a recreational area provided by the National Park Service and this Bureau cooperatively through a Memorandum of Understanding. This Bureau had no monetary investment in the building. It was owned by and fire protection was provided by the National Park Service.

IV. RESOURCES MANAGEMENT

Pea Island Campground Store was the only item to be entered in this section. Since this building no longer exists, no attempt to make a report on this section is necessary.

V. FIELD INVESTIGATION

No research project is established on Pea Island Refuge at this time. Minor investigational type work has included weekly waterfowl counts, one aerial count for Canada geese from Hatteras to the Virginia border, water salinity tests on the fresh water impoundments, and fertilizer test plots on the ryegrass field.

VI. PUBLIC RELATIONS

A. Recreational Uses

Total recreational-use days as determined by occasional spot checks will be found on Form NR-6. Recreational uses consist of sight seeing, fishing, bird watching, nature study, beach combing, and photography.

Based on spot checks, sport fishing along the surf and Oregon Inlet was improved over last year. Especially, this is true of the fall months. In October, many sport fishing parties made good catches of flounder, speckled trout, and puppy drum from the surf in waters adjacent to Pea Island Refuge.

B. Refuge Visitors

1. Registered Visitors

223 visitors from 19 States, the District of Columbia, England, and West Germany registered during this period at the reception office located at field headquarters.

2. Official Visitors

<u>Name and Organization</u>	<u>Date</u>	<u>Address</u>
Mr. Victor Kay, BSWW, Regional Office	9/11, 12/13	Atlanta, Ga.
Mr. R. R. Rudolph, BSWW, R.O.	10/14	Atlanta, Ga.
Mr. Charles Evans, BSWW, Patuxent	12/7	Laurel, Md.
Mr. Kenneth Wilson, N. C. Wild. Biologist	12/16	Greenville, N.C.

C. Refuge Participation

At the request of the Cape Hatteras Seashore Superintendent, the manager attended the pre-hunting season meeting on regulations on November 7 at the Bodie Island Visitor Center. The refuge manager was the only representative of the Bureau present and supplied information and literature on federal regulations applicable.

21 members of the Richmond Natural History Society visited the refuge on Saturday, December the 3rd. A short talk was provided by the manager, followed by a bird watching tour over the entire refuge. The National Park Service cooperated in this effort by providing a truck and a driver to help haul some of the group. Prior plans had been made before their arrival.

D. Violations

Two violators were apprehended on December 26 while shooting at geese in the North Pond ryegrass field from their car parked on the highway. Both men, Ellis Pugh of Salvo and Joseph "Mack" Midgett of Rodanthe, pleaded guilty before U. S. Commissioner Lloyd Sawyer in Elizabeth City. Both men received fines of \$50, \$25 suspended.

VII. OTHER ITEMS

A. Oregon Inlet Ferries

Ferry operation across Oregon Inlet is bad again this winter.

Operation difficulties were most prevalent in December. Many low tides have ruled. On November 4, there were 150 cars in line waiting to cross Oregon Inlet. Except on high tides, the ferry route has been changed, involving a 50 minute trip and no definite half-hour schedule. Many days, traveling back and forth has taken a toll of 3 to 4 hours.

B. Photographs

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

Date submitted: Jan. 18, 1961

Approved: Victor W. Kay
Act. Regional Refuge Supervisor

January 20, 1961

Respectfully submitted,

Charles F. Noble
Charles F. Noble
Refuge Manager



The pictures on this page show the condition of the 13 mile fence line after Hurricane Donna had passed. This fence is located along the west side of the highway-right-of-way passing through the refuge.





Some jeep roads on the refuge had 2 feet of litter covering them after Hurricane Donna. These pictures show the road around the outside of the South Pond piled deep with hurricane litter.





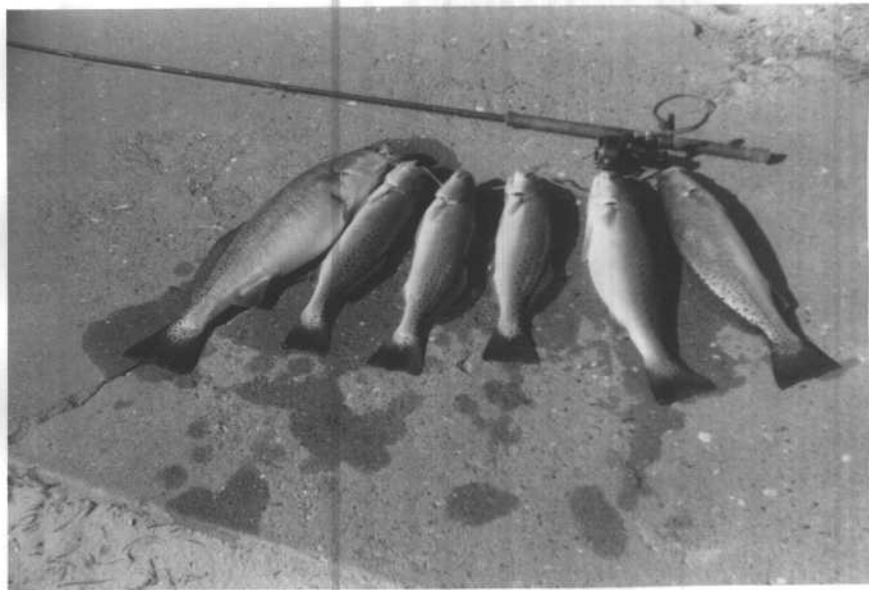
Grass at the top right is the top of the North Pond dike.
Hurricane drift came to $1\frac{1}{2}$ feet from the top of this dike.



Most drift deposited by the hurricane was along the east
side of the highway. The drift in this picture was between
the highway and the ocean front sand dunes.



Part of the Richmond Natural History Society group which visited the refuge is pictured after their return from a field trip over the refuge.



This is a November fisherman's catch from the surf along the Pea Island Refuge beach front. They are all speckled trout; the one on the far left weighed an even 5 lbs. and measured 2 ft. in length.



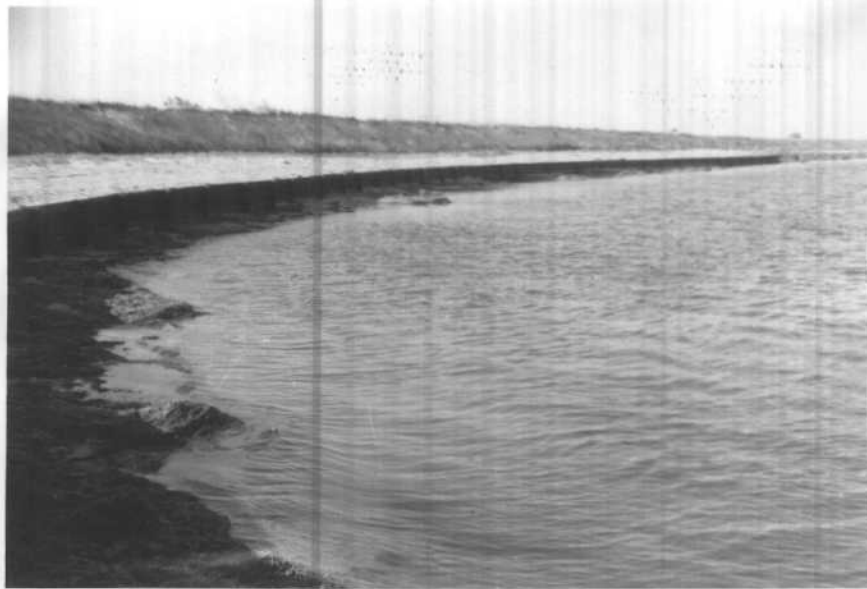
The Pea Island Campground Store located at the Oregon Inlet ferry landing was completely destroyed by fire on the night of October 16, 1960.



Planting operations on the 60 acre North Pond ryegrass field.



Both pictures on this page show the 1900 foot bulkhead constructed during this period. Both pictures were taken from one vantage point and show the entire length of the bulkhead. The one above was taken facing east and the lower one facing north-west. The structure is located on the south end of the North Pond.



W A T E R F O W L

REFUGE Pea Island

MONTHS OF Sept. 1 TO Dec. 31, 1960

(1) Species	(2) Weeks of reporting period									
	: 3 days-use									
	1	2	3	4	5	6	7	8	9	10
<u>Swans:</u>									70	112
Whistling										
Trumpeter										
<u>Geese:</u>										
Canada						700	900	1100	1100	3600
Cackling										
Brant										
White-fronted										
Snow						2	20	30	35	500
Blue										
Other										
<u>Ducks:</u>										
Mallard						10	10	50	50	50
Black	200	200	200	200	250	300	300	300	350	400
Gadwall	400	400	400	400	300	200	250	250	300	300
Baldpate						950	2000	800	300	1600
Pintail			600	400	400	800	2000	800	400	1200
Green-winged teal									20	300
Blue-winged teal	100	350	800	600	300	150	100			
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										50
Goldeneye										50
Bufflehead										25
Ruddy							14	10	10	
Other										
Red-breasted Merganser							400	500	500	300
Unidentified										400
<u>Coot:</u>							30	400	700	2200

Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

MONTHS OF Sept. 1 TO Dec. 31, 19 60

(1) Species	(2) Weeks of reporting period								(3)	(4)	
	11	12	13	14	15	16	17	18	Estimated waterfowl days use	Production Broods: Estimate seen : total	
Swans:											
Whistling	110	90	92	110	100	90	90	60	6,468		
Trumpeter											
Geese:											
Canada	4500	4800	5800	5900	6000	4800	5500	6000	354,900		
Cackling											
Brant											
White-fronted											
Snow	3500	3800	10,500	6500	6000	12,000	10,000	9000	370,209		
Blue	20	20	10	10				10	490		
Other -Richardson	1								7		
Ducks:											
Mallard	50	50	20	20	20	40	40	30	3,080		
Black	400	400	950	1100	1200	1000	1200	1100	69,550		
Gadwall	250	250	150	150	150	150	150	150	30,600		
Baldpate	1000	1000	850	600	700	600	500	350	78,750		
Pintail	1400	1200	2400	1200	1300	1500	1500	1300	128,800		
Green-winged teal	300	250	900	400	400	600	300	820	30,030		
Blue-winged teal									16,400		
Cinnamon teal											
Shoveler							20	10	210		
Wood											
Redhead											
Ring-necked					25	25	50		700		
Canvasback						2			14		
Scaup	100	200	175	500	600	400	600	500	21,875		
Goldeneye											
Bufflehead	300	400	500	1400	1200	1400	1200	1000	52,150		
Ruddy	25	25	10	10	10	10	10	15	1,218		
Other											
Red-breasted Merg.	300	300	200	200	200	200	200	200	24,500		
Unidentified	200	200	200	200	200	200	200	1000	19,600		
Total:	2000	1800	1200	1200	1200	1200	1100	800	96,810		

(over)

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans	6,468	112		Principal feeding areas Entire refuge. Pamlico Sound shoals, fresh water impoundments, salt marshes, sand dune areas, and ryegrass field.
Geese	725,606	16,800		
Ducks	477,477	6,475		Principal nesting areas No nesting during this period.
Coots	96,810	2,200		
Total -	1,306,361 waterfowl days-use.			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).

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge Pea IslandMonths of Sept. 1 to Dec. 31 1946

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total Estimate
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Number
<u>I. Water and Marsh Birds:</u>										
Little blue heron	Res.		90		5	12/30				100
Louisiana heron	"		100		22	12/30				110
Black-crowned night heron	"		120		16	12/30				200
Great blue heron	Winter Res.		8		8	12/30				10
Common egret	Res.		40		4	12/3				50
Snowy egret	"		200		30	12/30				300
Glossy ibis	Summer Res.		70		3	9/27				70
Clapper rail	Seen only occasionally due to birds habits.									200
Double-crested cormorant			800	11/4	30	12/27				2000
Gannet			60		2	12/30				100
Common loon			30		2	12/30				50
<u>II. Shorebirds, Gulls and Terns:</u>										
Common tern			400		20	11/4				500
Royal tern	Summer Res.		60	10/18	4	11/4				140
Herring gull			3000	12/13	200	12/30				4000
Ring-billed gull			2500	12/13	300	12/30				4000
Great black-backed gull			250	12/13	8	12/30				300
Laughing gull			2000	9/3	20	12/30				2500
American avocet			20	9/3	3	12/3				30
Black-necked stilt			4	9/22	2	12/3				4
Yellow legs, Great. & Less.			600		50	12/30				800
Sandpipers, All species			1000		300	12/30				1200

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove			8	11/5	(Occasionally a few doves are seen during the fall.)					
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	1	11/4	4		1	12/30				4
Sparrow hawk			5		2	12/30				6
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 Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

UPLAND GAME BIRDS

Refuge Pea Island

Months of Sept. 1 to Dec. 31, 19 60

(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, Spartina patens cover, and other marshes.								50	No good basic data is available on this species. However, sight observations have been less since Hurricane Donna in Sept.

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.

Refuge Pea Island

Calendar Year 1960

(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 Pea Island Refuge.														

Remarks:

Reported by _____

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 each species 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.

DISEASE

Refuge Pea Island Year 19 60

Botulism

Period of outbreak _____

Period of heaviest losses _____

Losses:

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

	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; probably malnutrition combined with too much salt ingestion.

Species affected Canada geese

Number Affected	Actual Count	Estimated
Species		
<u>Canada geese</u>	<u>52</u>	<u>75</u>
_____	_____	_____
_____	_____	_____

Number Recovered None

Number lost 52 (All birds counted were dead.)

Source of infection Probably salt marshes.

Water conditions Not Polluted.

Fair from Jan. 1 through spring migration.

Food conditions Poor in late fall - December, 1960.

28 dead from Jan. 1, 1960 to spring migration.

24 dead from fall migration through Dec. 31, 1960

Remarks It is likely that an increased toll will be recorded in the late winter months of this wintering season since the fall toll was higher than normal.

PUBLIC USE

Refuge Pea Island

Calendar Year 1960

Total Use Visitor-Days	Hunting Use	Fishing Use	Miscellaneous Use
14,000		4,000	10,000

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	Miscellaneous:	Percent	Visitor-Days
Waterfowl	None			Recreation *	60%	8,400
Upland Game	None			Official		
Big Game	None			Economic Use		
Supervised by refuge		by State	No. of blinds	Other	40%	5,600

Hunting (off
refuge lands): Estimated man-days of hunting on lands
adjacent to the refuge 1080 (These figures
should not be included in hunting-use totals above).

Fishing:

13 miles of ocean front and inlet shoreline.
Acres of ponds or lakes _____ and miles of streams
_____ open to fishing.

Comments:

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

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

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 Fed 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 Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested		Unharvested				
			Acres	Bu./Tons	Acres	Bu./Tons			
Japanese millet							25 acres for waterfowl seed crop	25	
Annual ryegrass							60 acres for winter goose browse crop.	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.

REFUGE GRAIN REPORT

Refuge Pea IslandMonths of Jan. 1 through Dec. 31, 1960

(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	60 bu.	None	60 bu.			60 bu.		0			
					(Used as bait on waterfowl banding program.)						

(8) Indicate shipping or collection points Received from Carolina Sandhills Refuge in fall of 1959.

(9) Grain is stored at _____

(10) Remarks All grain was used before spring migration.

*See instructions on back.

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.

Refuge Red IslandYear 1946

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

TIMBER REMOVAL

Refuge Pea Island Year 19460

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.....

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