

PEA ISLAND NATIONAL WILDLIFE REFUGE

Narrative Report for the Period January 1 through April 30, 1961

Table of Contents

	<u>Page</u>
I. GENERAL	
A. Weather Conditions	1
B. Habitat Conditions	2
II. WILDLIFE	
A. Migratory Birds	3
B. Upland Game Birds	4
C. Fur Animals, Rodents, and Other Mammals	4
D. Hawks and Eagles	4
E. Fish	5
F. Diseases	5
III. REFUGE DEVELOPMENT AND MAINTENANCE	
A. Maintenance	5
B. Plantings	5
C. Collections and Receipts	5
D. Control of Vegetation	5
E. Planned Burning	6
F. Fires	6
IV. RESOURCES MANAGEMENT	6
V. FIELD INVESTIGATION	6
VI. PUBLIC RELATIONS	
A. Recreational Uses	7
B. Refuge Visitors	7
C. Refuge Participation	8
D. Violations	8
VII. OTHER ITEMS	
A. Oregon Inlet Ferries	8
B. Photographs	8, 9, 10, and 11

PEA ISLAND NATIONAL WILDLIFE REFUGE

REFUGE NARRATIVE REPORT

January 1 through April 30, 1961

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

I. GENERAL

A. Weather Conditions

Winter lingered on this year until the last of April. The only mild, truly spring-like weather came for about three weeks at the last of February and first of March. Unseasonably cool weather prevailed throughout April with a frost occurring on April 19 in the Manteo area. January produced very cold weather with freezes recorded on 16 dates in that month on the beach front; continued freezing weather is uncommon next to the ocean along this coast line. From the 20th of January to the 4th of February, 16 days, minimum temperatures were below freezing, bringing the longest extended period of cold weather for the period. Strong winds accompanied much of the cold weather. The extremes in temperature were 17 degrees on January 26 and 88 degrees on April 24.

The Hatteras weather station reported a 70 mile per hour west wind on Sunday morning, February 26, before daybreak. This wind pushed water from Pamlico Sound over much of the refuge and across the state highway passing through the refuge.

Precipitation was 5.24 inches above normal for this four month period. The only month of the period showing a deficiency from normal was March; rain came on 12 days during that month so that precipitation was well distributed over the month. The total rainfall for the period was 18.83 inches.

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

<u>Month</u>	<u>Precipitation</u>			<u>Temperatures</u>	
	<u>This Month</u>	<u>Normal</u>	<u>Dev. from Normal</u>	<u>Max.</u>	<u>Min.</u>
Jan. -	3.35	3.26	+ 0.09	64	17
Feb. -	7.58	4.01	+ 3.57	70	30
March -	3.00	4.03	- 1.03	79	34
April -	4.90	2.29	+ 2.61	88	44
Totals -	18.83 in.	13.59 in.	+ 5.24 in.	Extremes - 88	17

B. Habitat Conditions

1. Water Conditions

The low rainfall and consequently the low impoundment water levels of the fall months have shown a carry-over effect on the impoundment water levels throughout the winter months. Heavy rainfall in February improved water level conditions in the two fresh water ponds, but these ponds never attained the levels generally experienced in the winter months. Most marshes along the marginal edge of the ponds did become inundated in late winter.

Water levels in the Pamlico Sound Proclamation Area are controlled for the most part by wind, normal changes in the ocean tide having little affect. In late winter many west and north-west winds prevailed; this produces a high water level over the shoals. One very strong west wind in late February piled Pamlico Sound water over most of the refuge; a storm tide level of only 3 feet below that produced by Hurricane Donna last fall developed. This water level was high enough to bring water over much of the jeep road on the outside of the South Pond dike.

Below are staff gauge readings from both impoundments taken near the end of each month. Readings in 1960 and 1961 are provided for comparative purposes.

Staff Gauge Readings

<u>End of Month</u>	<u>North Pond</u>		<u>South Pond</u>	
	<u>1960</u>	<u>1961</u>	<u>1960</u>	<u>1961</u>
January -	4.54	4.00	4.56	4.16
February -	5.16	4.46	5.12	4.48
March -	5.00	4.44	4.92	4.60
April -	4.78	4.16	4.60	4.50

2. Food and Cover

The waterfowl food supply was critical this winter. This condition is typical at Pea Island in any winter following a severe hurricane in the fall that inundates most of the refuge. A relatively large part of the beach pea crop was lost to the hurricane. Drought conditions in the fall months hurt the ryegrass browse crop. Then, winter was extremely cold. Geese found a low food supply and poor feeding conditions at Pea Island during the very cold weather of January. Most used of the areas were the salt marshes where the geese fed on salt meadow and salt marsh cordgrass. Vegetative growth was retarded by a cool spring, but some green-up occurred beginning with the first of March; this helped relieve some of the late winter distress.

Severe weather and high water combined left the sound shoals unattractive to feeding waterfowl. Some flocks did use this shallow water area, but they found poor feeding conditions.

II. WILDLIFE

A. Migratory Birds

1. Waterfowl

The waterfowl populations using the refuge regularly were comparable to those of last year. The peak population of the winter for Canada geese came in the fall, but a population of 5,200 was recorded in the first week of January this period; that was 800 less than the peak for the year and compares with 5,800 recorded last year as a peak in this period. Snow geese on the refuge decreased in January as compared with a peak of 12,000 in December; a peak population for this period of 7,000 was recorded the first week of January. Ducks also showed only a slight decrease with a peak for this period of 6,277 as compared with 6,950 for the same period last year.

A trend in waterfowl use within this locality should be recorded. That is, each winter for at least the last three years, waterfowl use of the Bodie Island marshes controlled by the Cape Hatteras Seashore Area has increased. For a period of two months this winter, approximately 12,000 snow geese remained in Dare County. The majority which were not on the refuge were in the Bodie Island marshes. The same is true of ducks. But Canada geese do not exhibit this trend noticeably until after the close of the waterfowl hunting season. Most of the Bodie Island marshes used by waterfowl are within a public hunting area. This area does have local affect on refuge waterfowl populations even during the open hunting season. Snow geese use marshes within this public hunting area throughout most of the hunting season. Most of the major

flock of Canada geese within this area stay on the refuge until after the close of hunting season. Ducks, of course, move back and forth depending on water, food, and weather conditions.

2. Wading Birds, Gulls, Terns, and Shorebirds

The influx of birds which use the heron rookery on the South Pond began about the first of April. On April 1, the first arrivals of glossy ibises were seen; there were 15 seen on that date. During the first week of April many of the nesting species which use the rookery increased rapidly. These include snowy and common egrets, black-crowned night herons, Louisiana herons, and little blue herons. It was April 23 before any yellow-crowned night herons were seen; at this time only two pairs were observed. By the end of April use of the rookery was well established.

Other birds of interest in this grouping were 3 American avocets seen on April 20, 3 black-necked stilts seen on April 23, and a pair of oyster catchers seen on April 24.

B. Upland Game Birds

Ring-necked pheasants are the only resident upland game birds found on Pea Island Refuge. Sight records of this species are common. An estimated 60 birds are found over the refuge. The major use areas for this species is in and around the two fresh water impoundments and the wax myrtle thickets on the north end of the refuge.

C. Fur Animals, Rodents, and Other Mammals

Four species of fur-bearing animals inhabit the refuge; these are muskrat, otter, nutria, and mink. Observations indicate that some changes should be made in the estimated populations as compared to last years report. Approximately 1800 muskrats are on the refuge; more nutria than previously realized are on the refuge - approximately 60 to 80. Two nutria were destroyed this period during walks in the marsh for other purposes. Otter and mink populations are estimated to be approximately the same as last year.

Rabbits are definitely established on the refuge now. Their tracks have been seen regularly over much of the refuge in recent months. Some have been run over on the state highway.

D. Hawks and Eagles

During this winter special requests have been made to report data on bald eagles. Close observation was made for any records of this bird on the refuge this winter; not one was seen through the entire winter on the refuge. The regular variety of hawks were seen during the period including the marsh hawk, duck hawk, sparrow hawk, and sharp-shinned hawk.

E. Fish

No fishery management activities are practiced on the refuge since only salt water species occur. Sport fishing activities during the period were non-existent and commercial fishing efforts were practically nil.

F. Diseases

Periodic checks were made over the refuge during this period for sick and dead geese. 58 Canada geese which were sick beyond recovery or dead were counted. These 58 are in addition to the 24 counted during the fall months and reported in the previous narrative report. This makes a total actual count of 82 for the winter. Since those sick and dead birds found are only a sample, it would not be surprising if at least 300 Canada geese died on the refuge this winter. Observations through the years show that geese are affected most drastically during winters following a severe hurricane in the fall. Factors involved are probably malnutrition and excessive salt consumption.

III. PHYSICAL DEVELOPMENT AND MAINTENANCE

A. Maintenance

Usual maintenance schedules have been followed during the period. Preventive and necessary maintenance was performed on vehicles, light plants, air-cooled engines, water pumps, boats, and outboard motors. Other routine work has included repainting, repairing, and replacing signs, repairs to doors and windows, and continued repairs to the 13 mile fence and gates.

B. Plantings

At the first of April, the exposed berm of the dike which was bulkheaded last fall was seeded with a variety of seeds. The purpose is to try to get a vegetative cover as cheaply as possible to control wind erosion. The seed used included Bermuda grass, fescue, rye, and Kobe lespedeza. Fertilizer was applied at the rate of 400 lbs. per acre of 5-10-10. It is too early to determine if any success can be expected although some of the seed have germinated. Bermuda grass, of course, is the species hoped to become established.

C. Collections and Receipts

None.

D. Control of Vegetation

Patuxent Research Center personnel established another test plot

this spring in the South Pond on Eurasian watermilfoil (*Myriophyllum spicatum*). Data on the progress of study on control of this plant was published by the Patuxent Research Center. Mr. John Steenis of Patuxent has headed up this project.

E. Planned Burning

Attempts at controlled burning of marshes this winter have failed. Due to excessive salt deposited on plants during Hurricane Donna and on other high tides, and due to lack of rainfall during early winter, and the lifting and placing of litter or 'duff' in drifts, conditions were not favorable for marsh burning. The marsh grasses would not carry a fire.

F. Fires

No wildfires or building fires occurred during the period.

IV. RESOURCES MANAGEMENT

No enterprises are being conducted on the refuge which bring in financial compensation. The only source of income was received from the Pea Island Campground Store which burned to the ground last fall.

V. FIELD INVESTIGATION

Considerable efforts were made toward goose trapping and banding this period. Some duck banding was accomplished but emphasis was placed on the Canada goose banding project. For over two months, the major field project was focused on goose trapping and banding. No actual baiting or banding was attempted until after the close of the migratory waterfowl hunting season. The results of this winters banding activities are as follows:

<u>Species</u>	<u>Birds Banded</u>	<u>Returns</u>	<u>Foreign Retraps</u>	<u>Repeats (Within 90 days)</u>	<u>Birds Trapped</u>
Canada geese -	117	4	1	54	- 176
Mallards -	2	2		2	- 6
Black duck -	44	2		12	- 58
Pintail -	3				- 3
Ring-necked duck -	1				- 1
Totals - (All Species)	167	8	1	68	- 244

VI. PUBLIC RELATIONS

A. Recreational Uses

A cold spring has retarded sport fishing activity. None was observed along the ocean front by the end of April.

Recreational uses of the area are low during the late winter months. General sightseeing and bird watching are the main uses in late winter and early spring. Even in cold weather, it is not uncommon to see bird watchers at the overlook platform on the North Pond.

B. Refuge Visitors1. Registered Visitors

152 visitors registered at the reception office located at refuge field headquarters.

One especially distinguished visitor was given a tour of the refuge by arrangement. On March 24, Sir Harold Caccia, British Ambassador to the United States and his Aide, Mr. Scot-Rankins of the British Embassy came to the 'Outer Banks' area for the particular purpose of seeing the birds at Pea Island Refuge. Sir Harold Caccia is an ardent bird watcher and seemed to enjoy his trip over the refuge very much. He came in the first 4-engine airplane to land at the Billy Mitchell Airport near Buxton.

2. Official Visitors

<u>Date</u>	<u>Name and Organization</u>	<u>Address</u>
Jan.	Mr. Donald Cross, Game Agent, BSWF	Elizabeth City, N. C.
3/24	Mr. Ted Ball, BSWF, Regional Office	Atlanta, Ga.
4/1	Mr. Taylor, Engineer, BSWF, Regional Office	Atlanta, Ga.
4/1	Mr. Joyner, Engineer, BSWF, Regional Office	Atlanta, Ga.
4/3	Mr. Otto Florschutz, N. C. Waterfowl Biologist	Washington, N. C.
4/14	Mr. John Steenis, BSWF, Patuxent Research C.	Patuxent, Md.
4/14	Mr. Gene Barrett, " " "	Patuxent, Md.
4/14	Mr. Frank McGilvery, BSWF Bio., Santee Refuge	Santee Refuge, S. C.
4/14	Mr. Ray Smith, SCS Wildlife Advisor	Raleigh, N. C.
4/25	Mr. Donald Hankla, Mgt. Bio., BSWF	Savannah Refuge, S. C.

C. Refuge Participation

On February 10, Dr. Gene Hester and a group of wildlife management students from North Carolina State College visited the refuge. They were given a short talk and orientation on the management history and present management practices on the refuge. They were then given a tour of the refuge and various management activities were described in the field.

A group of about 30 members of the Middle Atlantic States Audubon Society visited the refuge on Sunday, April 23rd. Most of the group were from the Washington, D. C. vicinity. After a short orientation talk, a half day tour was conducted for the primary purpose of bird watching. A walk for song bird observation was also included in the schedule.

D. Violations

After apprehending two violators at the last of December, waterfowl violations were not apparent for the remainder of the winter. A good amount of patrol work was done which probably helped to discourage attempts to violate.

VII. OTHER ITEMS

A. Oregon Inlet Ferries

Crossing Oregon Inlet has consumed many hours this period. The ferry route was changed involving a 1 hour ferry ride. This means that with ideal ferry connections, 1 ½ hours is consumed each way from Manteco to the refuge. With ferries operating at the rate of one per hour most of this period, the ferries are often loaded, requiring an additional hour wait at the ferry landing. Chances are good for an improvement soon since the State Highway Commission has announced plans to either dredge out the short ferry route or procure additional ferries.

B. Photographs

Please find pictures pertaining to the refuge on the following pages. It is regretted that no good pictures were gotten of one of the main activities, goose trapping and banding. With only two people on the operation, all hands were needed to carry on operations of the actual trapping activity.

Date submitted: May 16, 1961

Approved: (sgd) Victor W. Kay
Acting Regional Refuge Supervisor
May 18, 1961

Respectfully submitted,

Charles F. Noble
Charles F. Noble
Refuge Manager

The bulkhead built in the fall of 1960 on the North Pond held up well through its first winter. The following series of pictures are arranged in chronological order and were taken from approximately the same location.



1. Dike berm, North Pond, Spring of 1960



2. Same location as above, Summer of 1960 after dragline rebuilding.

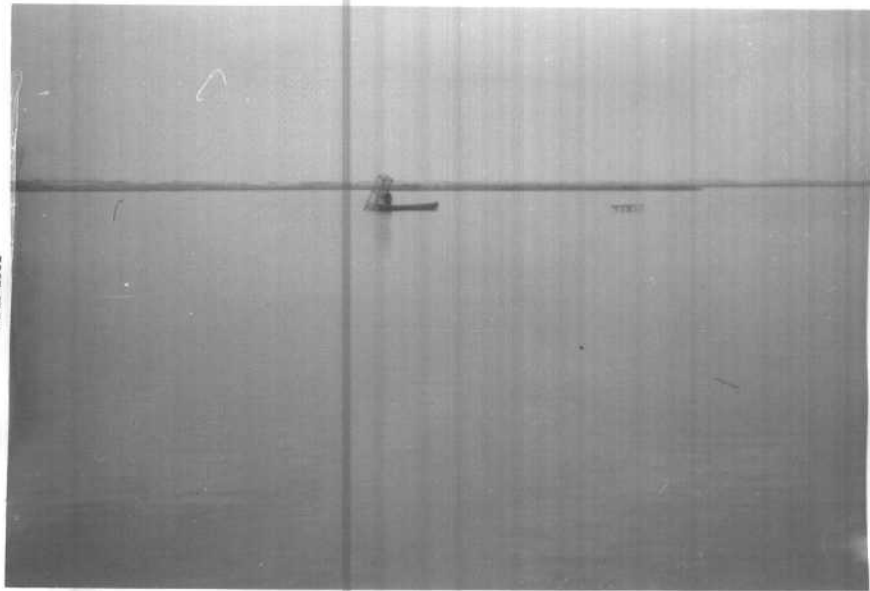


3. Last of the series showing bulkhead. Picture taken from near the same location as pictures on page 9, showing bulkhead after completion of construction. This structure may have saved the dike from washing out this winter; it would have washed badly with the strong north winds that were frequent in mid-winter.



Drift bulldozed off jeep roads after high water of Feb. 26. It had previously been bulldozed off following Hurricane Donna.

APR 1961



Tending stilt-legged duck traps in the South Pond.

APR 1961



Sir Harold Caccia, British Ambassador to the U. S. visited the refuge on March 24, 1961.

W A T E R F O W L

REFUGE McClelland

MONTHS OF Jan. 1 TO April 30, 1961

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling	50	20	16	10	21	36	32	30	22	15
Trumpeter										
Geese:										
Canada	5200	4600	4200	3900	4200	4100	3900	3200	2400	1600
Cackling										
Brant										
White-fronted										
Snow	7000	3000	2000	3000	3300	4000	3500	500	10	12
Blue			2	6						
Other										
Ducks:										
Mallard	40	30	30	30	50	70	80	60	30	30
Black	1300	900	900	1100	1200	1200	900	800	600	700
Gadwall	150	150	150	150	150	150	150	150	100	50
Baldpate	600	400	200	300	400	500	300	400	200	200
Pintail	1400	900	600	700	900	700	600	600	300	100
Green-winged teal	900	600	500	600	700	600	500	400	400	50
Blue-winged teal										
Cinnamon teal										
Shoveler	20	20	20	30	20	30	40	30	20	10
Wood										
Redhead	2		2	4						
Ring-necked	25					25	25	30	30	20
Canvasback		2	2	2	2	2	2			
Scaup	600	400	400	400	400	400	350	300	200	200
Goldeneye										
Bufflehead	900	1000	900	900	900	800	800	700	600	500
Ruddy	20	25	30	20	20	50	50	50	30	10
Other										
Mergansers	220	200	200	300	300	300	400	500	500	500
Unidentified	100	200	300	200	200	100	200	100	100	
Coot: American	600	200	100	100	150	200	150	100	40	40

3 -1750a

Cont. NR-1

(Rev. March 1953)

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

REFUGE Pea IslandMONTHS OF Jan. 1 TO April 30, 1961

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production :Broods:Estimate : seen : total	
	11	12	13	14	15	16	17	18			
Swans:											
Whistling	17								1,039		
Trumpeter											
Geese:											
Canada	1100	800	800	700	300	200	150	150	203,000		
Cackling		1	1	1	1	1	1	1	43		
Brant											
White-fronted											
Snow	10	4	0	25	30	40	40		135,207		
Blue									70		
Other											
Ducks:											
Mallard	10	6	10	10					3,402		
Black	600	500	500	500	400	400	300	300	89,000		
Gadwall	50	100	100	100	100	150	200	200	15,250		
Baldpate	200	100	150	200	50				29,400		
Pintail	50	20	50	10					44,510		
Green-winged teal	200	150	200	100	300	400	50	50	16,600		
Blue-winged teal	10	30	50	200	300	200	100	100	6,330		
Cinnamon teal											
Shoveler		50	20	10	10				2,310		
Wood											
Redhead									56		
Ring-necked		10							1,155		
Canvasback									84		
Scaup	150	100	100	100					20,700		
Goldeneye											
Bufflehead	300	100	100	100	100	100			61,600		
Ruddy	10	10	10	10	10	10			2,555		
Other											
Mergansers	500	500	500	400	400	300	300	300	141,510		
Unidentified									10,500		
Coot: American	40	20	20	20	20	10	10	10	12,750		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	1,939	50		Principal feeding areas <u>Impoundments, fresh marsh, salt marsh, beach pea dunes, ryegrass field, and Pamlico Sound shoals.</u>
Geese	479,210	12,200		
Ducks	390,892	6,277		Principal nesting areas _____
Coots	12,750	600		
884,791 - Total Waterfowl Days Use				Reported by <u>Charles F. Noble, Refuge Manager</u>

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

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

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge Point Pelee Months of Jan. 2 to April 20 1956

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Little blue heron	5	2/27	30	4/23	resent	End of period				50
Louisiana heron	6	1/6	60	4/23	"	"				100
Black-crowned night heron	10	2/6	70	4/23	"	"				100
Yellow-crowned night heron	4	4/23	4	4/23	"	"				6
Common egret	4	1/6	40	4/23	"	"				60
Snowy egret	14	1/6	30	4/23	"	"				140
Glossy ibis	15	4/1	35	4/23	"	"				45
Common loon	2	1/6	20	2/27	"	"				50
Double-crested cormorant	200	2/27	2,000	4/1						2,000
Clapper rail		No accurate data due to secretive nature of bird.								150
II. <u>Shorebirds, Gulls and Terns:</u>										
Common tern	6	4/1	200	4/24	Present	End of Period				400
Royal tern	4	4/10	20	4/24	"	"				50
Least tern	8	4/1	70	4/24	"	"				200
Herring gull	500	1/6	2,000	2/27	"	"				4,000
Ring-billed gull	500	1/6	2,500	2/27	"	"				5,000
Bonapartes gull	30	4/2	90	4/10	6	4/27				200
Laughing gull	6	4/1	2,500	4/24	Present	End of Period				4,000
Willetts	12	4/10	120	4/23	"	"				200
Black-necked stilts	3	4/23	3	4/23	"	"				3
American avocet	3	4/20	3	4/20	"	"				3
Oyster catcher	2	4/24	2	4/24	"	"				8
Yellowlegs, great. & less.	Res.		300	4/24						500
Sandpipers, all species	All year		2,000	4/24						3,000

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove		April	12	April						Transient
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	1	1/6	2	2/27	1	4/23				4

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.

3-1752

Form NR-2

(April 1946)

UPLAND GAME BIRDS

Refuge Red IslandMonths of Jan. 1 to April 30, 1961

(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	Wetlands, water hyacinth tangles, salt- meadow cordgrass, and other high marshes. (This bird uses about 1/3 of the high marsh and upland refuge acreage - and estimated 1,000 acres.)	17							60	Well established from New Inlet to Regan Inlet.

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 San Juan

Year ending April 30, 1961

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion	
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
								Permit Number	Trappers Share	Refuge share				
Muskrats	Cattail, three-square, cordgrass, and fresh water impoundments. (1500 acres)	0.8												1000
Otter	Range overall of the land area and tidal creeks(5000 acres).	1.06												30
Nutria	Same as muskrat area listed above. (1500 acres)	20												70

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS:

Reported by Charles F. Noble, Refuge Manager

INSTRUCTIONS

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

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