

PEA ISLAND NATIONAL WILDLIFE REFUGE

Narrative Report for the Period May 1 through August 31, 1962

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PEA ISLAND NATIONAL WILDLIFE REFUGE

REFUGE NARRATIVE REPORT

May 1 through August 31, 1962

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

I. GENERAL

A. Weather Conditions

Weather has been good. The temperatures, winds, and rain have been near that which can be expected during a normal summer period. Some heavy rains occurred during mid and late summer. One weak storm passed off the coast on Aug. 27 which influenced tides and brought rain; it was not large enough to do any damage in this area. Prior to June 29, May and June had been dry with only 3.70 inches of rain for almost a two month period. During the next six days the rains fell-10.12 inches; this was a very wet time, but Pea Island needed it.

Rainfall for the period was 5.25 inches above the six year average. Temperature extremes were a high of 94 degrees recorded on July 15 and a low of 50 degrees recorded on June 19.

The following table provides weather data from the Bodie Island weather station operated by the National Park Service. It is located 3 miles north of the refuge and reflects weather conditions on the refuge.

<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>
May -	1.66	2.91	-1.25	91	52
June -	7.38	2.90	+4.48	90	50
July -	7.39	4.36	+3.03	94	61
August -	6.20	7.21	-1.01	92	67
Totals -	22.63in.	17.38in.	+5.25	Extremes -	94 50

B. Habitat Conditions

1. Water Conditions

Neither the North or South Pond bottoms have been exposed this summer. The impoundment water levels dropped to their lowest point in the middle of June; the North Pond staff gauge reading was 3.74 feet and the South Pond was 3.62 feet. This condition occurred just prior to the heavy rains of late June and early July. Water levels of the ponds throughout the remainder of the summer were satisfactory and in some cases exceptionally high for the summer period. Following are staff gauge readings taken near the end of each month from both North and South Ponds. 1961 and 1962 readings are provided for comparative purposes.

Staff Gauge Readings

<u>End of Month</u>	<u>North Pond</u>		<u>South Pond</u>	
	<u>1961</u>	<u>1962</u>	<u>1961</u>	<u>1962</u>
May -	4.22	4.18	4.22	4.10
June -	4.32	3.74	4.38	3.62
July -	3.90	4.30	4.10	4.16
August -	4.56	4.20	4.40	4.42

No turbulent water conditions developed on the Pamlico Sound Shoals this summer. Normal fluxuations in water levels have existed throughout the period bringing about good Sound water conditions.

The change in water salinity content in the two impoundments since the March 7th storm has been the most important condition of water habitat to evaluate during this period. This condition has, of course, brought about significant changes in the ecology of the two impoundments. A frequent schedule of water salinity testing within the impoundments has been followed during the period. The silver nitrate titration method was used. A summary of the results of these tests will be found in the following table.

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

<u>Date</u>	<u>North Pond</u>			<u>South Pond</u>		
	<u>North End</u>	<u>At Gauge</u>	<u>Gauge Reading</u>	<u>North End</u>	<u>On West Side</u>	<u>Gauge Reading</u>
5/4/62	32.9%	33.2%	4.68	33.9%	33.6%	4.70
5/11/62	33.8%	33.8%	4.50	33.4%	33.8%	4.50
5/18/62	33.8%	34.5%	4.44	33.1%	35 %	4.34
5/23/62	34.8%	33.8%	4.32	30.7%	33.6%	4.24
5/31/62	36.1%	36.1%	4.18	32.9%	31.6%	4.10

1085

6/7/62	36.6%	39.2%	4.12	34.2%	34 %	3.88
6/20/62	38.7%	37.1%	3.86	32.6%	32.2%	3.70
7/5/62	19.5%	19.7%	4.66	11.6%	11.4%	4.48
7/17/62	22.39%	21.58%	4.54	14.12%	13.97%	4.30
8/1/62	25.14%	24.52%	4.28	16.61%	16.14%	4.08
8/20/62	31.83%	29.49%	3.86	19.24%	18.31%	3.96

2. Food and Cover

Food and cover are abundant during the summer for all species of birds and mammals which inhabit the refuge.

Prospects for a bumper crop of native waterfowl food plants within the impoundments are encouraging at this time. Accidental salting of the marshes and open water areas within the two impoundments by the March 7th storm has apparently provided a stimulus for seed germination and plant growth. Most of the marshes are covered by a dense and robust growth of American three-square with a lesser amount of robust three-square and wild millet. Roots of American three-square are a favorite food of Canada geese in this area when the marsh surface is covered by a few inches of water. The shallow open water areas of the impoundments have good submerged aquatic coverage although low quality plants are most prevalent. Some of the plants found in the ponds this summer are mushgrasses, sago pondweed, widgeongrass, redhead grass, and a small amount of wildcelery. The pond bottom of the South Pond has approximately 85% plant coverage this summer whereas it was 85% barren in the summer of 1961; approximately 80% of this plant coverage is by muskgrasses (*Chara* sp.); other plants found in South Pond are sago pondweed and widgeongrass. In the North Pond muskgrasses are also the prevalent species although they compose only 50 to 60% of the plant community. Sago pondweed and widgeon grass are more common with minor quantities of redheadgrass and wild celery. The impoundment areas should provide very good feeding habitat for waterfowl during the forthcoming winter.

Other changes in the plant community have been noted. Smartweed which was abundant last year in South Pond was reduced drastically. Annual flowering plants which were becoming far too abundant prior to the storm are practically non-existent. On the other side of the ledger, cattail seed germination developed late in the summer in localized areas. No flowering heads appeared on these plants by mid-August. Additional cattail seed may germinate next spring.

Some changes occurred in waterfowl food plants outside the impoundments which may or may not have resulted from the March storm. *Spartina alterniflora*, the primary food for snow geese which winter at Pea Island, has expanded its previous boundaries and produced a luxuriant growth throughout its marsh zone. Beach pea growths are

scattered and the plant is less abundant than in the previous four years.

Any effects of the storm are not indicated on the submerged aquatic beds in the Pamlico Sound. Widgeongrass and shoalgrass beds on the Proclamation Area of the refuge are equal to past years and should provide habitat as in past years.

II. WILDLIFE

A. Migratory Birds

1. Waterfowl

Most waterfowl had migrated northward before the beginning of this narrative report period on May 1. Some few Canada geese remained on the refuge into this period; 12 were seen as late as the second week of July. Some blackducks, gadwalls, and blue-winged teal can be seen throughout the summer. All three of these species nest on the refuge. The first duck broods of the season observed were two broods of black ducks seen on May 25. Production of young by all species was greatly reduced this year. So many changes occurred in the environment and habitat that no specific reason can be determined for the poor production of ducklings. Plant species have changed considerably, most woody plants inside the impoundments are dead, the water has changed from fresh to brackish, and additional animal species occur in the pond water. Blue crabs came in the ponds by the thousands with developments in the March storm. Refuge personnel has observed predation on ducklings by blue crabs on two occasions during the summer. If nesting ducks respond to discouraging predicaments, the predation on ducklings by blue crabs may be a factor in the drastic reduction of ducklings produced at Pea Island this year. Time should alleviate the conditions which have produced poor duck nesting and eventually duck production will be at levels of previous years. Duck broods seen and production will be found on Form NR-1.

2. Wading Birds and Gulls

A colonial bird rookery has been located in South Pond at Pea Island Refuge for many years. Locations used for nesting were primarily composed of large wax myrtle bushes. Most wax myrtle bushes within South and North Ponds were defoliated after the March storm; many plants died. Late in the spring, the colonial birds which nest at Pea Island began using the southernmost island in the North Pond which still had some green foliage; a rookery was established and all species which have nested at Pea Island in the past were represented. Nesting species include: glossy ibis, snowy egret, common egret, Louisiana heron, little blue heron, black-crowned night heron, and yellow-crowned night heron. Some nesting occurred early in the spring along the banks of the South Pond dike by common egrets and black-crowned night herons; all other species concentrated in their entirety on the island in the North Pond to build nest and hatch their young. Most species

nested in reduced numbers as compared with last year. One exception was the glossy ibis which was almost double the nesting population of last year.

No major concentration of gulls nested this year within the refuge boundaries. Major concentrations of laughing gulls nested near the refuge on islands in Oregon Inlet and frequented the refuge.

B. Upland Game Birds

Other than an occasional mourning dove, ring-necked pheasants constitute the upland game birds found on the refuge. They continue on the increase. Surprisingly, the March storm, had little affect on pheasants which inhabit the refuge. Approximately 200 are now using the refuge. Two pheasant broods were seen on one trip around the North Pond jeep trail on June 27.

C. Fur Animals

Fur animals found on the refuge in order of abundance are muskrats, nutria, other, and mink.

D. Hawks and Eagles

No unusual conditions of hawk or eagle was occurred. One sight record of a bald eagle was made on May 6.

E. Fish

All sport fishing in this area is for salt water species. Normal fishing activity occurred during the summer. It has been noted that small jumping mullets moved into the impoundments following the March storm. They are 7-8 inches long now and are abundant.

F. Diseases

No bird or mammal diseases were observed during the period.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Maintenance and Repairs

Necessary and preventive maintenance was performed on vehicles, light plants, water pumps, air-cooled engines, outboard motors, boats, tractors, farm equipment, and herbicide spraying equipment. All windows in the main headquarters buildings were puttied and painted; new wire was placed in all window screens; all facings and outside trim were painted. The domestic water tanks were cleaned and repaired and bad plumbing was replaced. A system of concrete walls were constructed at headquarters buildings; posts were placed beside all parking areas and walkways to avoid travel over the sand and add to the appearance of headquarters. Water control gates on the impoundments were repaired as necessary after

ponds had drained down following the March storm. Many usable creosote fence parts were pulled out where they had bent or been covered by sand in the March storm. Jeep trails around the ponds were repaired where washouts had occurred. All large refuge signs were repaired, re-stained, and lettering was re-painted. The Dodge pickup truck was re-painted in a commercial garage. An underground diesel tank and pump were installed since all tractor equipment being used is diesel.

On a reimbursable basis, the National Park Service has progressed well on repairs to the damaged sanddunes. The work is completed from Oregon Inlet through New Inlet. In conjunction with these repairs, all of the sand deposited by the storm in the North and South Pond fields was removed and used for re-establishing sand-dunes. In a meeting on August 31, it was agreed that the Bureau will reimburse the National Park Service in the amount of \$181,000; \$303,000 was allotted for storm damage repairs at Pea Island Refuge.

B. Plantings

No marsh plantings were made during the period. Summers when water level conditions are suitable, millet is planted in the South Pond field. Water levels were too high this summer to accomplish this job. Prior to millet planting time, soil samples from the South Pond field were analysed for salinity content. Samples ran well over, 3000 parts per million of soluble salts. The N. C. Department of Agriculture does not recommend that any crops be planted where salinity content exceeds 3000 parts per million.

C. Collection and Receipts

None

D. Control of Vegetation

25 acres of wax myrtle growth was plowed up in the area between the two impoundments. A few acres of this may be seeded to ryegrass this fall to determine the salt and soil tolerances of ryegrass for a goose browse crop.

8 acres of cattail within the impoundments were treated with dalapon. Much of this cattail which appeared late in the summer was apparently the result of cattail seed germination. Close observation should be made next spring for cattail seedlings. The cattail treated this summer appeared dead at the end of August.

E. Planned Burning

No marsh burning is done at Pea Island during the summer period. However, preparation for fall and winter burning is made during the summer. 11 miles of fire lane have been plowed with a new-ground disk plow to maintain a fire break 15 feet wide. The

fire lanes are now in better condition than they have ever been in the past at Pea Island.

F. Fires

No wildfires or building fires occurred.

IV. RESOURCES MANAGEMENT

No resource harvesting permits are in force, and no financial income is being obtained from the refuge resources at this time.

V. FIELD INVESTIGATION

Close observations have been made of the impoundments since the accidental introduction of salt water. These observations are recorded throughout this report. Frequent water salinity tests have been made during the period and are recorded in a table with this report.

VI. PUBLIC RELATIONS

A. Recreational Uses

Recreational uses of the refuge include sightseeing, fishing, beach combing, photography, and native and wildlife observation.

B. Refuge Visitors

1. Registered Visitors

Registered visitors at the reception office located at field headquarters decreased 27% this period as compared with the same period last year. 926 registered this period as compared with 1,261 for the four month period last year.

2. Official Visitors

<u>Date</u>	<u>Name and Organization</u>	<u>Address</u>
5/2	Mr. John Steenis, BSW	Laurel, Md.
5/2	Mr. Clark Webster, BSW	Savannah Refuge
5/2	Mr. Ted Ball, BSW, Regional Office	Atlanta, Ga.
6/15	Mr. Frank McGilvrey, BSW	Laurel, Md.
6/15	Mr. John Steenis, BSW	Laurel, Md.
6/16	Mr. Hugh Fields, N. C. Extension Service	Raleigh, N. C.
6/16	Dr. F. Eugene Hester, N. C. State College	Raleigh, N. C.

6/21	Dr. T. L. Quay, N. C. State College	Raleigh, N. C.
7/26	Mr. Wallace Wiest, BSW, River Basins	Raleigh, N. C.
8/13	Mr. E. R. Brumback, GAO	Washington, D. C.
8/13	Mr. W. L. Norton, Jr., GAO	Washington, D. C.
8/31	Mr. L. S. Givens, BSW, Regional Office	Atlanta, Ga.
8/31	Mr. James Taylor, BSW, Engineer	Atlanta, Ga.

C. Refuge Participation

On July 25 a talk and a tour up the refuge was provided for 42 children from the Cherokee Indian School located at Robbinsville in south-western North Carolina. This program was provided in conjunction with their week at the Roanoke Island 4-H Camp near Manteo. Student Trainee Overby participated in this activity.

D. Safety

A safety meeting was held each month of the period. No accidents occurred during the period. The last accident at Pea Island occurred on January 21, 1958. 1,674 calendar days have passed since the last accident. Approximately 23,148 man/hours of work have been performed since the last 'lost time' accident. Badly broken walkways used regularly by the public were replaced during the period to avoid stumbling and possible injuries. Safety in fuel use and storage was stressed.

VII. OTHER ITEMS

A. Summer Student Trainee

Mr. R. Donald Overby was assigned to Pea Island Refuge to participate in the National Wildlife Refuge trainee program this summer. His performance was excellent and his potential for a refuge manager position is very good.

B. New Equipment

A small case 310E crawler tractor was purchased new during the period. It is performing its function at Pea Island well. A new turning disk plow was acquired to use with the crawler tractor and is proving to be good for fire lane maintenance and deep plowing.

C. Photographs

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

Date submitted: September 15, 1962 Respectfully submitted,

Approved: Lawrence S. Lee Charles F. Noble
Regional Refuge Supervisor Charles F. Noble
Refuge Manager

SEP 17 1962

• SEP • 62 C



After the March 7th Storm some areas of sand dunes were completely flattened.

• SEP • 62 C



The public highway through the refuge was located along side the fence posts in this picture. A high sand dike with sand fence atop has been machine built down this same line.

• SEP • 62 C



As in these pictures near refuge field headquarters, a sand dune line has been rebuilt using sand deposited during the March Storm to the west of the original dune line.

• SEP • 62 C





Sand used to rebuild this dune was obtained from the sand deposited in the North Pond ryegrass field. Note the vegetation which came from roots off the field that inadvertently were scrapped up during the operation in a few places.



Sand fence has been placed atop most of the dunes that have been rebuilt. It appears to be doing a good job of holding sand but has not yet stood the test of a storm.

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

W A T E R F O W L

REFUGE Pea Island Refuge

MONTHS OF May 1 TO Aug. 31, 19 62

(1) Species	(2) Weeks of reporting period									
	5 days-use									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	50	40	40	25	25	25	12	12	12	12
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard										
Black	150	100	100	100	120	180	160	160	160	150
Gadwall	150	150	150	150	130	130	180	200	230	230
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal	100	100	50	20	20	10	10	20	20	30
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead	10	10								
Ruddy										
Other										
Coot: American	10	10	10	10	10					

Int. Pub. Sec.

3 -1750a

Cont. NR-1

(Rev. March 1953)

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

REFUGE Pea Island RefugeMONTHS OF May 1 TO Aug. 31, 19 62

(1) Species	(2) Weeks of reporting period								(3) Estimated 6 days-use waterfowl days use	(4) Production Broods: Estimated seen : total	
	11	12	13	14	15	16	17	18			
<u>Swans:</u>											
Whistling											
Trumpeter											
<u>Geese:</u>											
Canada	12								1,755		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
<u>Ducks:</u>											
Mallard											
Black	120	120	120	100	80	80	150	200	15,950	10	60
Gadwall	200	150	100	80	120	150	150	150	19,150	27	150
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal	40	30	30	30	40	150	200	300	7,900	3	20
Cinnamon teal											
Shoveler											
Wood											
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead									120		
Ruddy											
Other											
<u>Coot:</u> American									330		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	:	:	:
Geese	1,755	50	:
Ducks	43,120	650	:
Coots	330	10	:
Total -	45,205	Waterfowl Days-use	

SUMMARY	
Principal feeding areas	Impoundment Areas.
Principal nesting areas	Dikes, Marsh, and Islands within the impoundments used by gadwall & blue-winged teal.
Entire refuge used by black ducks.	
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 Island Refuge

Months of May 1 to Aug. 31 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	48	5/11	150	7/11	32	8/28	1	25	65	200
Louisiana heron	62	5/11	325	7/11	85	8/28	1	60	175	400
Black-crowned night heron	58	5/11	250	7/11	100	8/28	2	40	125	350
Yellow-crowned night heron	2	5/11	6	7/11	4	8/15	1	2	2	6
Common egret	30	5/11	75	7/11	35	8/28	2	15	36	150
Snowy egret	90	5/11	375	7/11	125	8/28	1	50	155	500
Glossy ibis	60	5/11	150	7/11	25	8/28	1	40	100	200
Great blue heron	1	7/18	4	8/28	4	8/28				5
Clapper rail	1	5/22	3	7/18	1	8/15				200
II. <u>Shorebirds, Gulls and Terns:</u>										
Black-backed gull	6	5/11	6	5/11	2	8/28				10
Herring gull	500	5/11	500	5/11	25	8/28				600
Ring-billed gull	600	5/11	600	5/11	15	8/28				700
Laughing gull	1,400	5/11	3,000	7/18	1,500	8/28				4,000
Bonapartes gull	12	5/11	12	5/11	12	5/11				200
Common tern	40	5/11	400	7/18	30	8/28				600
Royal tern	10	5/11	200	7/18	12	8/28				400
Least tern	50	5/11	500	7/18	80	8/28				800
Black skimmers	200	5/11	2,000	7/18	300	8/28				3,000
Willetts	160	5/11	800	7/18	30	8/28				1,000
Yellowlegs, great. & less.	150	5/11	900	7/18	400	8/28				1,200
Sandpipers, all species	1,200	5/11	4,000	7/18	200	8/28				6,000

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove			18	8/28	18	8/28				40
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	1	5/11	1	5/11	1	5/11				1
	6	5/11	300	8/30	300	8/30				300
Reported by <u>Charles F. Noble, Refuge Manager</u>										

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.

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, 19⁶²
Reported by Charles F. Noble Title Refuge Manager

(1) Area or Unit Designation		(2) Habitat Type Acreage		(3) Use-days	(4) Breeding Population	(5) Production
UNIT 1: All unimpounded area from New Inlet north to Oregon Inlet.	Crops			Ducks 259,000		
	Upland	592		Geese 567,000		
	Marsh	2,664		Swans		
	Water	16,000		Coots		
	Total	19,256		Total 826,000		
UNIT 2: Pool No. 2 (North Pond) An Impoundment.	Crops	68		Ducks 226,700	96	188
	Upland	98		Geese 340,200		
	Marsh	74		Swans 9,060		
	Water	400		Coots 69,240		
	Total	640		Total 645,200	96	188
UNIT 3: Pool No. 1: (South Pond) An Impoundment.	Crops			Ducks 97,150	18	42
	Upland	50		Geese 170,100		
	Marsh	145		Swans 2,270		
	Water	180		Coots 17,320		
	Total	375		Total 286,840	18	42
UNIT 4: All area from New Inlet to the south boundary.	Crops			Ducks 64,760		
	Upland	393		Geese 56,850		
	Marsh	1,216		Swans		
	Water	9,700		Coots		
	Total	11,309		Total 121,610		
Sub-totals for the Refuge *	Crops	68		Ducks 647,610	114	230
	Upland	1,133		Geese 1,134,150		
	Marsh	4,099		Swans 11,330		
	Water	26,280		Coots 86,560		
GRAND TOTALS -	Total	31,580		Total 1,879,650	114	230
	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.

(April 1946)

UPLAND GAME BIRDS

Refuge Pea Island Refuge

Months of May 1 to Aug. 31, 19 62

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'y'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked pheasant	Dikes, wax myrtle thickets, uplands, and marshes	5.4	10	120					200	
	* Density figure based on habitat of 1080 acres.									

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

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

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