

PEA ISLAND NATIONAL WILDLIFE REFUGE

Narrative Report

January 1 to December 31, 1971

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I. GENERAL

A. Weather Conditions

The year started with temperatures ranging 4 to 12 degrees below normal. These low temperatures, coupled with 15 to 20 M.P.H. north winds, through most of the month of January made it rather cold out here. Temperatures warmed up the 13th of February when a storm hit the area bringing winds of 77 M.P.H.

A northwester hit the area on March 3 and flooded the area with sound water. This was followed by a northeaster with steady winds of 47 M.P.H. and gusts of up to 70 M.P.H. which hit the area on March 26 and continued through most of the 27. Rainfall for March totaled 5.96, 3.08 inches above normal.

The weather during April and May was normal.

June was an extremely dry month, when only 2.29 inches of rain fell, compared to a normal of 4.56 inches. This drought was relieved slightly during the month of July, when 5.32 inches of rain fell.

Weather was normal until hurricane Ginger hit on September 29, bringing 75 M.P.H. winds and 15.55 inches of rain.

The weather was nice for the rest of the year, with temperatures ranging from 85 to 27 during the months of November and December. Several high temperature records were set during December.

The following weather data were obtained from the National Park Service's weather station located on Bodie Island about 11 miles north of refuge headquarters.

	<u>Precipitation</u>			<u>Temperatures</u>	
	<u>1970</u>	<u>*Normal</u>	<u>Dev. from Normal</u>	<u>Max.</u>	<u>Min.</u>
Jan.	4.21	4.80	- .59	65	15
Feb.	5.09	4.64	+ .45	78	21
Mar.	5.96	2.88	+3.08	73	31
Apr.	2.84	3.14	- .30	83	33
May	5.34	3.95	+1.39	83	43
June	2.29	4.56	-2.27	93	55
July	5.32	6.15	- .83	93	66
Aug.	6.32	6.00	+ .32	95	62
Sept.	8.70	5.19	+3.51	89	58
Oct.	15.07	3.34	+11.73	82	52
Nov.	2.54	3.12	- .58	85	33
Dec.	1.39	3.53	-2.14	76	27
Total	65.07	51.30	+13.77	95	15

*Normal precipitation is the average for the 10 year period, 1960-69.

B. Habitat Conditions

1. Water

The water levels in the fresh water impoundments remained adequate throughout the entire year. This resulted from heavier than usual rainfall during the crucial months of August, September, and November.

Salinity readings were low during the month of September, October, November, and December. This was due to heavy rainfall. High sound tides, which are sometimes used to raise the salinity content of the fresh water impoundments, were never high enough to flow into the impoundments in worthwhile quantities.

Silver Nitrate titrations were conducted throughout the year to determine salinities. Salinity tests were as follows:

Water Salinity Tests During 1971 (Readings in ‰ sea strength)

<u>Date</u>	<u>North Pond</u>			<u>South Pond</u>			<u>Pamlico Sound</u>	
	<u>North End</u>	<u>At Gauge</u>	<u>Gauge Reading</u>	<u>At Gauge</u>	<u>West Side</u>	<u>Gauge Reading</u>	<u>Tidal Creek</u>	<u>Salt Pond</u>
1/22	9.16	9.00	1.90	7.30	7.14	2.00	62.09	58.99
2/10	7.92	7.76	2.28	5.74	6.21	2.18	46.57	47.35
3/17	7.14	7.30	2.36	5.28	5.59	2.26	37.26	52.78
4/14	6.21	5.90	2.60	4.04	3.75	2.08	50.45	62.09
5/18	6.36	6.21	1.96	4.35	4.50	1.88	49.36	55.11
6/16	7.30	7.92	1.56	6.52	5.74	1.20	62.09	63.64
7/22	8.07	6.36	1.48	5.90	5.90	1.36	41.92	66.75
8/18	8.54	8.38	1.12	9.31	7.76	1.04	76.06	68.30
9/17	8.85	7.45	1.14	8.07	10.56	1.10	51.23	58.99
10/14	5.28	3.42	2.64	1.86	2.02	2.76	43.47	29.49
11/19	4.50	3.88	2.00	2.02	2.02	2.18	52.01	34.93
12/21	3.73	3.73	2.00	1.55	1.71	2.15	31.05	42.70

2. Food and Cover

Ninety-five acres, 40 acres at the south end of the refuge and 55 acres in New Field, were planted to ryegrass in September and October. This produced a good green browse crop and was utilized heavily by both snow and Canada geese.

There was good to fair production of natural foods on most of the refuge. High sound tides, during the first part of this wintering season, allowed waterfowl to feed in the higher sound marshes. Then in December, low sound tides allowed the Canada geese and ducks to feed on the shoals in the sound.

Vegetation surveys were run in North, South, and Salt Ponds, and New Field by Biologist Florschutz and Refuge Personnel.

A five point vegetation sampler was used at 30 foot intervals along established transect lines. The four lines run in 1971 totaled 10,110 feet along which 340 stops were made and samples were taken from 1,700 points. A summary of the 1971 data and comparison between previous years are as follows:

TABLE 1

North Pond Vegetation Transect Line Comparison
1968 - 71

<u>Species or Group</u>	<u>1971</u>	<u>1970</u>	<u>1969</u>	<u>1968</u>
	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>
Muskgrasses (<u>Chara spp.</u>)	7.5	69.7	76.7	87.6
Dwarf Spikerush (<u>Eleocharis parvula</u>)	7.5	0.9	0.6	0.9
Water Hyssop (<u>Bacopa monnieri</u>)	3.4			
Three-square (<u>Scirpus Americanus</u>)	1.4			
Spikerushes (<u>Eleocharis spp.</u>)	1.1	3.5		
Panic Grass (<u>Panicum sp.</u>)	0.6			
Saltgrass (<u>Distichlis spicata</u>)	0.6			
Sago Pondweed (<u>Potamogeton pectinatus</u>)		4.9	15.2	10.6
Bare Ground	77.9	21.0	7.5	0.9
Total	100.0	100.0	100.0	100.0

The increase of bare ground was primarily at the expense of the muskgrasses, which were very sparse in the shallow water areas. Muskgrass and sago pondweed, both good waterfowl foods, were abundant and healthy in the deeper water areas.

TABLE 2

South Pond Vegetation Transect Line Comparison
1968 - 71

Species or Group	1971 %	1970 %	1969 %	1968 %
Muskgrass (<u>Chara</u> spp.)	70.2	55.6	15.1	31.1
Spikerushes (<u>Eleocharis</u> spp.)	8.6	9.8	8.1	4.6
Sago Pondweed (<u>Potamogeton pectinatus</u>)	5.4	5.3	6.4	8.5
Water Hyssop (<u>Bacopa monnifera</u>)	4.6	8.0	6.8	1.1
Dwarf Spikerush (<u>Eleocharis parvula</u>)	3.4	3.6	4.2	
Fleabone (<u>Pluchea camphorata</u>)	0.9			
Three-square (<u>Scirpus Americanus</u>)	0.9	0.6	0.3	0.3
Frog Fruit (<u>Lippia</u> sp.)	0.3			
Saltgrass (<u>Distichlis spicata</u>)	0.3			
Widgeongrass (<u>Lippia maritima</u>)	0.3		1.0	0.8
Wild Millet (<u>Echinochloa crusgalli</u>)	0.3			
Unidentified		0.9		
Bare Ground	4.9	16.3	56.1	3.6
Totals	100.1	100.1	100.0	100.0

Muskgrass showed significant increase while other species reflected little change in abundance.

TABLE 3

Salt Pond Vegetation Transect Line Comparison
1968 - 71

Species or Group	1971 %	1970 %	1969 %	1968 %
Glasswarts (<u>Salecormia</u> spp.)	28.9	24.9	17.0	15.4
Filamentous Algae	26.6	11.4	13.8	35.8
Saltmarsh Cordgrass (<u>Spartina alterniflora</u>)	2.1	2.9	2.3	1.5
Saltgrass (<u>Distichlis spicata</u>)	1.5	1.5	1.2	
Panic Grass (<u>Panicum</u> sp.)	0.1		0.9	1.0
Miscellaneous		1.3	0.2	5.3
Bare Ground	40.8	58.0	62.6	42.0
Totals	100.0	100.0	100.0	100.0

Filamentous algae showed a slight increase in 1971 over 1970, while other species remained about the same. This area produced very little food.

TABLE 4

New Field Vegetation Transect Line Comparisons
1968 - 71

Species or Group	1971 %	1970 %	1969 %	1968 %
Saltmeadow Cordgrass (<u>Spartina patens</u>)	15.7	22.5	22.9	22.2
Wild Millet (<u>Echinochloa crusgalli</u>)	8.8	7.6	0.5	0.2
Flat Sedges (<u>Cyperus</u> spp.)	7.8	3.1	1.7	4.1
Spikerushes (<u>Eleocharis</u> spp.)	5.9	5.3	1.2	2.4
Saltgrass (<u>Distichlis spicata</u>)	5.6	2.5	2.8	3.7
Broomsedge (<u>Andropogon virginicus</u>)	5.2	3.2	1.0	
Saltmarsh Cordgrass (<u>Spartina alterniflora</u>)	4.8	2.7	7.6	11.1
Glassworts (<u>Salicornia</u> spp.)	4.5	1.6	0.9	1.1
Panic Grasses (<u>Panicum</u> spp.)	4.5	3.0	4.3	1.1
Three-square (<u>Scirpus americanus</u>)	4.5	4.1	6.6	1.8
Chickweed (<u>Stellaria media</u>)	3.7	2.7		
Horsetweed (<u>Conyza canadensis</u>)	3.7	6.8	13.9	5.8
Smartweed (<u>Polygonum</u> spp.)	1.9	1.3	2.2	
Morning Glory (<u>Ipomea</u> spp.)	1.4	2.1	0.2	1.3
Seaside Goldenrod (<u>Solidago sempervirens</u>)	1.0	2.6	0.7	
Fleabone (<u>Pluchea camphorata</u>)	0.5	1.4	0.9	1.0
Wax Myrtle (<u>Myrica cerifera</u>)	0.5	7.8	2.6	
Groundselbush (<u>Raccharis halimiflora</u>)	0.5	4.7	2.6	6.6
Miscellaneous	5.2	3.4	5.7	15.6
Bare Ground	14.4	11.8	21.8	22.0
Total	100.1	100.2	100.1	100.0

The middle and part of the lower zones of the New Field were burned in January of 1971. A good burn was accomplished on most of the area, killing a large per cent of the myrtle and groundsel bush. The per cent of non-waterfowl food plants was reduced from 58.4% in 1970 to 46.8% in 1971. The highest part of New Field was again planted to ryegrass.

Quantitative data was not obtained on food production, but good quantities of waterfowl foods were produced on the entire refuge. Good stands of S. patens and S. alterniflora and some S. robustus were produced in the salt marshes. The fresh water marshes produced S. robustus, S. americanus, millet and panicums.

An excellent stand of submergents was produced on the shoals of Pamlico Sound.

The waterlevels were such this year that the foods in all the areas could be utilized at one time or the other.

II. WILDLIFE

A. Migratory Birds

1. Waterfowl

Total use days for all groups of waterfowl increased in 1971. The use day data were as follows:

Species	1970	1971
Swans	15,903	24,759
Geese	1,122,736	1,176,835
Ducks	1,764,245	1,798,554
Coots	213,475	149,966
TOTAL	3,116,359	3,450,114

Total waterfowl use days on the refuge increased some 333,755 use days. However, Canada goose use days dropped to 338,549. This was the third year in a row that the Canada goose population declined. Snow goose use increased approximately 112,000 use days over 1970.

Total duck use showed a slight increase. Species showing an increase were: gadwall, green-winged teal, blue-winged teal, shoveler, redhead, ring-neck, canvasback, bufflehead, and ruddy. Mallard, black-duck, American widgeon, scaup, and pintail all showed a decrease.

The five following species of diving ducks showed an increase of approximately 271,000 use days: redhead, canvasback, ring-neck, bufflehead, and ruddy. Most of the diving ducks use occurred in North Pond.

Coots showed an increase of 237,000 use days.

Duck production showed an increase in 1971, an estimated 831 young were produced. Production included 10 mallards, 160 black ducks, 1 green-winged teal, 6 blue-winged teal, 4 red-breasted mergansers, and 650 gadwall.

A European widgeon was seen on October 22. Bird was seen several times in North Pond.

A Ross' goose was sighted in the New Field area on April 1. Prior to his spring migration from the refuge he was sighted several times. The following December 23, a Ross' goose was again sighted in New Field. Judging from the limp of the bird in both sightings this was the same bird.

A common teal was sighted in North Pond on December 30.

2. Wading Birds, Gulls, Terns and Shore Birds

The wading bird rookery consisted of parts of three different islands in North Pond. Estimated production was 130 glossy ibis, 10 common egret, 60 snowy egret, 45 Louisiana heron, 45 little blue heron, 20 cattle egret, and 70 black-crowned night heron.

A tern and skimmer nesting colony was started on the beach at the south end of the refuge. This colony contained an estimated 150 skimmer nests, 10 royal tern nests, 50 common tern nests, 25 gull-billed tern nests and 250 least tern nests on June 14. Both terns and skimmers were beginning to hatch, but when the area was checked again on June 23, no young birds were present and very few eggs were found. By June 25, the remaining eggs had disappeared. Probably a combination of predation and public use contributed to the breakup of this colony. Tracks were found where a predator had rolled eggs over a considerable area trying to crack them. Tracks left by people walking and dune buggies were also found in the area.

Nesting willets were quite numerous on the refuge. Black-necked stilts, oystercatchers and avocets also nested on the refuge.

Several black rails were seen in the New Field area after it had been burned. Virginia, clapper, and sora rails were also observed on several occasions.

Great black-backed, herring, ring-billed and laughing gulls were all found in large numbers at certain times.

B. Upland Game Birds

Mourning dove and ring-necked pheasant are the only upland game birds found on the refuge, although the dove is not very numerous. The pheasant population is estimated at 390 birds. Production was estimated at 150 birds. With this kind of production and no enemies other than cars, the population is increasing at a substantial rate.

C. Big Game Animals

None occur on the refuge.

D. Fur Animals, Predators, Rodents and Other Mammals

The number of muskrat sightings and the amount of sign has both increased over last year. They are starting to do considerable damage to the dikes, the dike berm, and the water control structures.

Both otter sightings and sign are becoming more numerous on the refuge. One otter was seen in the Tidal Creek west of South Pond and two were seen in North Pond. One dead otter was found in North Pond. Apparently it had been hit by a car. The animal's head was severely damaged.

Several nutria sightings were made this year. Some nutria damage to the dikes has been noted.

No mink sightings have been made this year.

Feral cats are frequently observed on the refuge.

E. Hawks, Eagles, Owls, Crows, Ravens and Magpies

The marsh hawk was observed more often than any other hawk, although sparrow hawks were very abundant at times. The peregrine falcon seemed to be more numerous, with 8 sightings this year. Other hawks observed were: sharp-shinned, cooper's, red-tailed, red-shouldered, rough-legged and pigeon.

Several osprey sightings were made around the North Pond and New Field areas.

Barn, screech, short-eared and saw-whet owls were all observed on the refuge. Two road-killed barn owls were found.

Both common and fish crows occurred on the refuge, but neither were particularly abundant.

F. Other Birds

The Carolina Bird Club listed 172 species on their Outer Banks meeting of September 24-26. Birds of particular interest found on the refuge were the reddish egret, buff-breasted sandpipers, and Hudsonian godwits. The reddish egret had been sighted only once previously in the State.

The Christmas bird count, held on December 30, 1971, produced 113 species on the refuge. The most notable birds seen during this count was the Ross' goose and the common teal.

One scissor-tailed flycatcher was observed several times during the month of August.

G. Fish

Fishing was poor this year, or maybe everybody was spoiled after the 1970 fishing season. Sport fishing was slow all year. The commercial fishermen did pick up a few rockfish and bluefish around Oregon Inlet in November and December.

H. Reptiles

Several snapping turtles were seen in and around the fresh water impoundments. Diamondback terrapins were abundant in the sound and tidal creeks, while yellow-bellied sliders were numerous in all the fresh water ponds.

A loggerhead sea turtle came ashore to lay her eggs, just south of refuge headquarters, on the night of June 13. She made what appeared to be two nests, one was about even with high tide line and the other one was several yards north and several feet further up on the beach. A small depression was noted at the lowest nest site on August 27. The nest site was checked again on August 30 and 2 young were found just under the surface. The nest cavity was then excavated and 24 more live young, 1 dead young, 4 eggs, and an estimated 68 shell fragments were found. This nest held an estimated 98 to 100 eggs from which 94 young hatched. The other site was checked daily until September 17, when the site was excavated. Nothing was found at this site.

Two eastern glass lizards were found. An occasional six-lined racerunner was seen.

Water snakes, blackracers, and eastern hognose snakes are found on the refuge. No poisonous snakes have been observed on the refuge.

I. Diseases

The usual amount of sick and dead fowl were found on the refuge, but no diseases were noted.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

New refuge signs were put up at the office and at the north and south entrances.

A new well and approximately 300 feet of plastic pipe to supply water for office and residence was put down.

Marle floor was put in pole shed.

New parking lot at north end of North Pond was shaped up and marle base put down.

Wakefield piling around North and South Ponds was repaired and replaced as needed.

Preventive and minor maintenance on vehicles, air-cooled engines, pumps, boats, outboard motors, and farm equipment was accomplished.

Scraping and painting of buildings, road and dike mowing, and fire lane disking were other maintenance jobs accomplished.

B. Plantings

1. Aquatics and Marsh Plants

None.

2. Trees and Shrubs

None.

3. Upland Herbaceous Plants

None.

4. Cultivated Crops

Ninety-five acres of common ryegrass were planted for green browse. This included 55 acres in New Field and 40 acres at the south end of the refuge. Approximately 50 pounds of ryegrass seed and 400 pounds of 10-20-20 fertilizer were sown per acre.

Most of the grass had a good start before the geese arrived. Snow geese and Canada geese both utilized the green browse heavily.

C. Collections and Receipts

One hundred and seventy-five bushels of shelled corn were received from Pungo Refuge. This was used in our banding program.

D. Control of Vegetation

Approximately 6.5 miles of dikes were mowed three times to prevent the intrusion of waxmyrtle, bayberry, and black locust bushes.

Spot treatments of Typha domingensis and T. angustifolia were made in both impoundments, New Field, bar ditches along N. C. highway 12, and other isolated areas. Treatment was with Dalapon at an application rate of 10 lbs. per acre. Approximately 5 acres were treated at a cost of \$69. per acre.

E. Planned Burning

After several wet starts, we finally got a fair to good burn in New Field the latter part of January. Dense stands of Spartina patens and waxmyrtle made a real hot fire killing most of the myrtles. An attempt was made to burn a small area north of New Inlet, but this contained mostly black rush which would not burn.

In December approximately 450 acres at the north end of the refuge were burned. This area was grown up in waxmyrtle and bayberry with a heavy growth of dead grass under them. This fire burned very hot killing most of the waxmyrtle and bayberry.

F. Fires

Nothing to report.

IV. RESOURCES MANAGEMENT

A. Grazing

No grazing on the refuge.

B. Haying

No haying on the refuge.

C. Fur Harvest

None on the refuge.

D. Timber Removal

No timber on the refuge.

E. Commercial Fishing

All fishing is in state controlled navigable sound water and along the beach. No refuge permit is required for fishing.

F. Other Uses

None.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

Dr. William Campbell of North Carolina State is conducting a study on the insects affecting vegetation used in coastal dune stabilization. On Pea Island he is working on a scale that kills out American beach grass. The 1971 phase included the application of Dimethoate by helicopter and its effect on ghost crabs and minnows in the area. He is operating under Permit No. 4-70-10.

Refuge staff banding accomplishments were:

Post-season:	
Canada geese	82
Black duck	32
Spring:	
Canada geese	47
Pre-season:	
Mallard	1
Black duck	5
Red-breasted merganser	1
Gadwall	110

The pre-season banding was done to help determine factors affecting the local nesting gadwall population.

In addition to the waterfowl banded by the refuge staff, Mr. V. L. Downing of the Denver Research Center banded the following young birds in the wading bird rookery:

Louisiana Heron	6
Glossy Ibis	8
Little Blue Heron	1
Black-crowned Night Heron	7

VI. PUBLIC RELATIONS

A. Recreational Uses

Refuge recreational use amounted to 1,169,888 total visits. Sightseers passing through the refuge on N. C. highway 12 accounted for about 65% of the visits. Among the wildlife related activities, saltwater fishing accounted for 14% of the total, wildlife observation accounted for 10% and beachcombing accounted for about 5%. Other uses occurred, but to a much smaller degree.

Each of the months of May through August showed over 100,000 visits, while April showed 74,660 and September showed 88,754.

Some 1,588 signed in the refuge visitor log. These visitors represented 35 states, the District of Columbia, Canada, Uruguay, and Spain.

B. Refuge Visitors

The visitors listed below are but a few of those who signed the visitor log.

Lamar A. Pope, Weather Bureau	Durston, N. C.
Dane Hamilton, N.C. Wildlife Resources	Williamston, N. C.
Walt Chason, Game Protector	Manteo, N. C.
Warren Lupton, G.M.A.	Washington, N. C.
Mike Williams, Virginian Pilot	Norfolk, Va.
Lawrence Maddry, Virginian Pilot	Norfolk, Va.
Otto Florschutz, Jr., East Coast Biologist	Washington, N. C.
Luther Goldman, B.S.F.W.	Washington, D. C.
John H. Shugart, Regional Office	Atlanta, Georgia
J. M. Paulson, Boating Editor Field & Stream	Mentor, Ohio
W. O. Stieglitz, Regional Office	Atlanta, Georgia
Richard B. Hamilton, Game Biologist N.C.W.R.C.	Williamston, N. C.
Dr. R. L. Wilson, U.T.C. Geology Dept.	Chattanooga, Tenn.
Karl Graetz, S. C. S.	Raleigh, N. C.
Larry Givens, Regional Office	Atlanta, Georgia
C. L. Moffett, Regional Office	Atlanta, Georgia
R. L. Downing, B.S.F.W.	Denver, Colo.
Dick Lingman, Regional Office	Atlanta, Georgia
Robert Wetmore, Dent. of the Interior	Portland, Oregon
Bob Spake, Farm Agent	Manteo, N. C.
Ward Daniels, B.S.F.W.	Chincoteague, Refuge
Dr. T. L. Quay, N. C. State U.	Raleigh, N. C.
Dr. William Campbell, N. C. State U.	Raleigh, N. C.
Jack Donnelly, Biologist, N.C.W.R.C.	Washington, N. C.
Dan Connelly, Biologist, N.C.W.R.C.	Washington, N. C.
Paul Sykes, B.S.F.W.	Delray Beach, Fla.
George Ross, G.M.A.	Edenton, N. C.
Al Noltemeier, G.M.A.	Washington, N. C.
Phil DuMont, B.S.F.W.	Washington, D. C.
Mel Evans, Refuge Manager	Santee Refuge
John Fields, Refuge Manager	Pungo Refuge
Lt. Cdr. J. G. McPhillan, Naval Oceanographic	Norfolk, Va.
Joseph C. Cheeseman, Naval Oceanographic	Washington, D. C.
Paul Tipton, N.P.S.	Manteo, N. C.

Preston Riddle, N.P.S.
Vince Mrazek, N.P.S.
Bert Roberts, N.P.S.
Gerald Perry, N. C. Comm. Fisheries
Jim Henning, N.P.S.
Robert Cheeseman, N.P.S.
Bobby Thomas, N.P.S.

Manteo, N. C.
Manteo, N. C.
Manteo, N. C.
Kitty Hawk, N. C.
Wags Head, N. C.
Manteo, N. C.
Wags Head, N. C.

C. Refuge Participation

Refuge personnel gave tours to several interested groups.

A display was constructed in Manteo High School by refuge personnel during Marine Science Week.

D. Hunting

Hunting is not allowed on the refuge.

E. Violations

A total of 59 cases were made this year. This included 2 for hunting on the refuge. They were disposed of by forfeiture of \$100. collateral each.

Two cases of possessing a firearm on refuge were taken before the Commissioner, where each was disposed of by a \$25. fine and one sawed-off shotgun was confiscated and ordered destroyed.

The other cases included 31 for illegal camping, 23 for driving off of authorized roadway, 1 for boating in an unauthorized area, 2 for trespass, and 1 for removing and destroying government property (refuge sign). All but 4 of these were disposed of by a fine of \$25. or a forfeiture of \$25. collateral. Three of the cases are still pending and one went before the Magistrate and was disposed of with a \$40. fine.

F. Safety

Monthly safety meetings were held at refuge headquarters. Regional safety material plus other pertinent material were covered and discussed.

Topics discussed were defensive driving, fire prevention, and proper use and maintenance of hand tools and equipment.

The last lost time accident was January 21, 1958. As of January 31, there has been 5,063 calendar days since the last lost time accident with approximately 74,260 man-hours worked.

Future plans are to continue with our monthly safety meetings and to correct any hazardous conditions that might occur before an accident happens. Protective clothing will be acquired as needed.

VII. OTHER ITEMS

A. Items of Interest

A permit was issued to the Department of the Navy for the temporary establishment of an electronic triangulation station at Refuge Headquarters from May 1 to August 31. The station was set up to check out experimental equipment.

The U. S. Corps of Engineers was issued a permit to set up a triangulation station on the refuge for the purpose of distance measuring equipment in conjunction with underwater gravity surveys being conducted in Pamlico and Albemarle sounds by the Corps.

The State Highway Department finally put up some post along the edge of the highway at the south end of Oregon Inlet Bridge.

We finally got a refuge clerk! Mrs. Beverly Daniels was hired as a part time clerk-typist on October 6.

Messrs. Williamson and Peyton attended the P.P.E.E. Workshop in Raleigh on October 26 through the 29.

Mrs. Daniels attended the Cost Accounting Workshop in Atlanta on November 29 - December 1.

B. Photographs.

Photographs are on pages following signature.

C. Credit

This entire report was prepared by Mr. George Peyton, Assistant Refuge Manager.

Typing of this report is credited to Mrs. Daniels our clerk.

Date:

3/27/72

Submitted by:

D. F. Williamson Jr.

Approval:

E. F. Johnson

APR 4 1972

Assistant Regional Supervisor



New refuge sign at the south entrance of the refuge. (R3-11-71)



Completed sign in front of refuge office. (R1-7-71)



Refuge sign at north end of refuge as you are leaving. In the background is the Herbert C. Bonner Bridge over Oregon Inlet. (R7-19-71)



Posts put up by North Carolina Highway Department to stop people from parking beside the highway. Just a short distance to the east of the highway is a 60 car parking lot that usually contains very few cars. (R7-17-71)



A L-H group from Roadanthe which was conducted on a tour of the refuge. (R3-14-71)



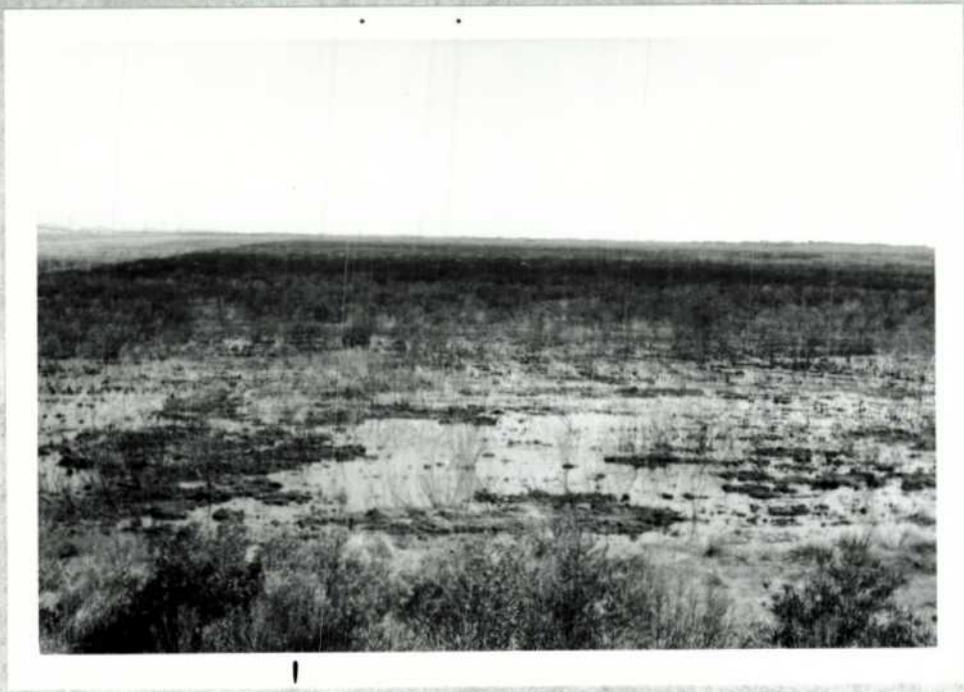
We have wildlife visitors too. This young blackracer was found at the office door waiting for someone to open up. (R7-3-71)



Heavy wax myrtle growth in New Field during control burn. The fire burned real hot killing most of the myrtles. (R1-9-71)



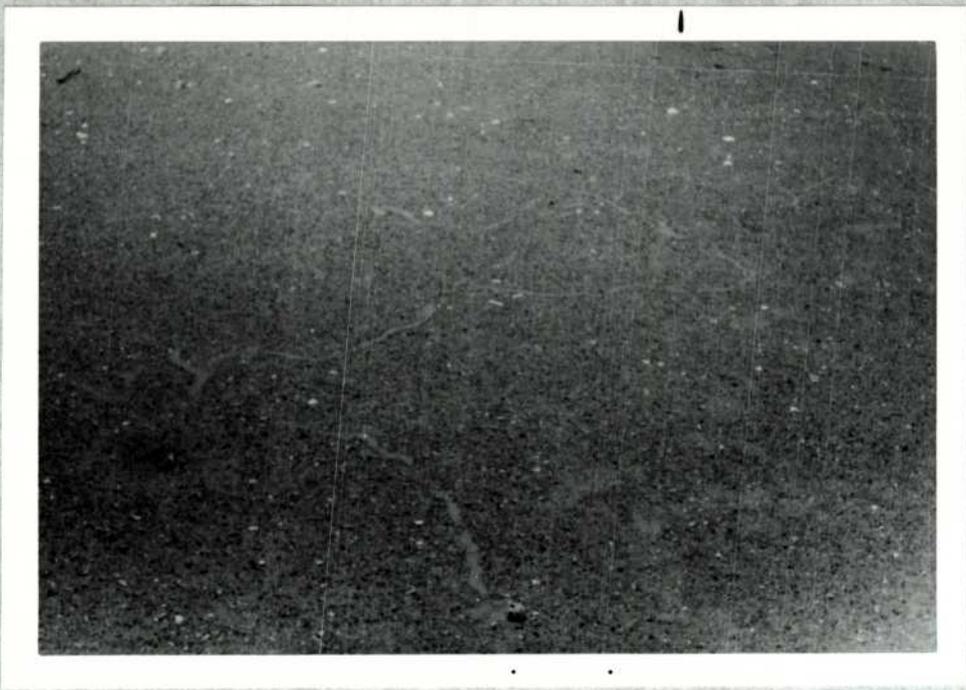
Dense mat of Spartina patens in New Field during control burn. (R1-8-71)



New Field area after burn. This area had heavy snow goose use after the burn. (Photo by Florschutz)



Beach vehicle tracks through area containing tern and skimmer nesting colony. (R6-5-71)



Track left by the egg in the foreground as a predator rolled it around trying to break it. (R6-11-71)



Cat track and broken egg shell in tern and skimmer nesting colony. (R6-16-71)



Tracks left by a loggerhead sea turtle on June 13 as she came ashore just south of refuge headquarters to lay her eggs. (R6-4-71)



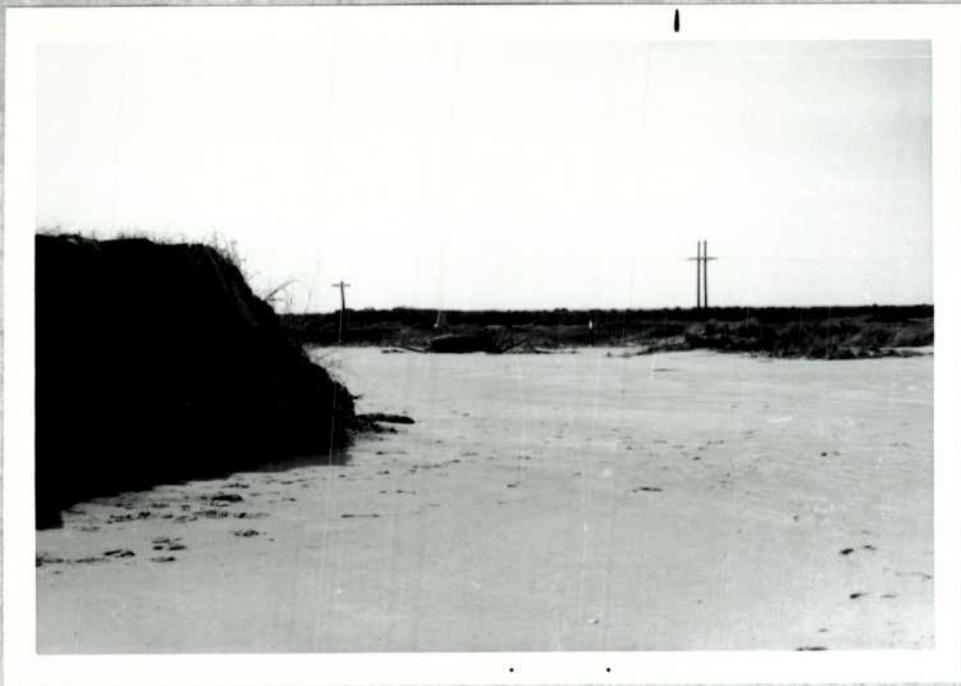
Twenty-four young loggerhead turtles of an estimated 94 which hatched on the refuge. (R7-4-71)



Washout of the primary dunes at mile post 9 caused by the March 26-27 storm. North Pond was not damaged because secondary dunes were not breached. The scout is parked on old highway 12 which was relocated in 1966. Photo was taken shortly after storm. (R5-20-71)



Same area as top photo showing how continuing erosion has now eaten back into old highway 12. Photo was taken in December. (R7-15-71)



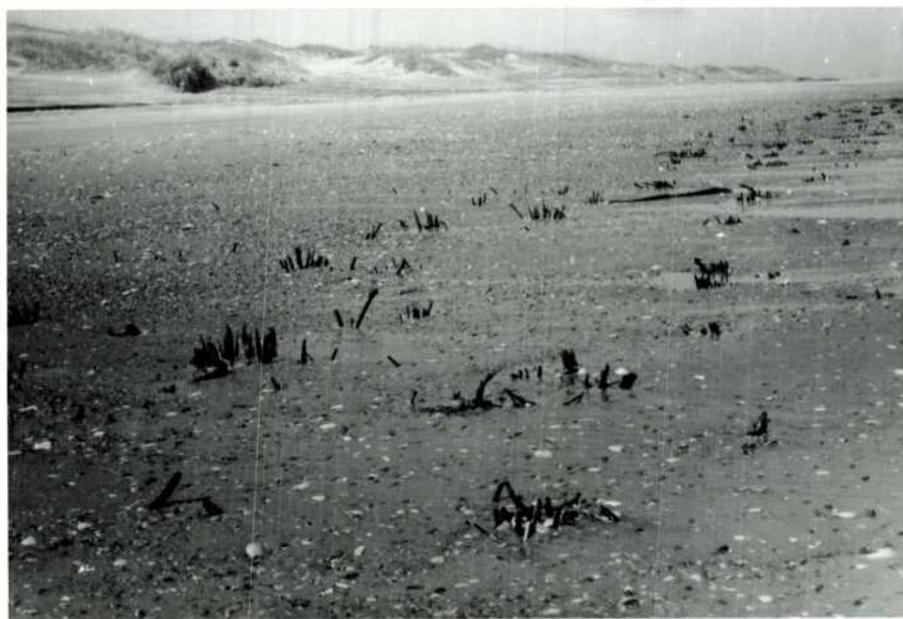
Washout of the dunes just south of the refuge line. Refuge entry sign and boundary sign can be seen in background. (R3-19-71)



Low place in the dunes in the South Pond area. The tide has washed over this low place and several others during extremely strong and persistent Northeasters. (R5-13-71)



Steep dune banks and a narrow beach are the results of severe erosion. (R7-14-71)



This was clear ocean beach before erosion uncovered the remains of what appears to have once been a marsh area. (R7-16-71)

WATERFOWL

REFUGE Sea Island

MONTHS OF January TO April, 1971

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
	Swans:									
Whistling	30	30	5	2	3	8	2	12	20	27
Trumpeter										
Geese:										
Canada	3,725	3,001	2,112	2,716	3,321	3,325	1,006	1,471	2,052	1,715
Cackling										
Brant										
White-fronted										
Snow	7,721	7,001	7,705	1,301	1,245	8,227	1,233	2,128	3,142	2,330
Blue	34	3	7	2	30	31		5	11	12
Other										
Ducks:										
Mallard	35	55	30	65	116	105	21	12	5	
Black	2,300	2,300	2,122	1,355	1,253	1,322	1,122	1,200	1,221	247
Gadwall	170	125	122	129	112	111	15	7	12	20
Baldpate	500	500	300	112	50	30	12	10		50
Pintail	2,501	2,500	1,311	1,222	500	500	500	50	50	
Green-winged teal	3,000	2,125	1,500	300	50	70	1,300	2,000	1,000	
Blue-winged teal										
Cinnamon teal										
Noveler	312	500	100	300	1,115	1,115	250	212	200	320
Wood										
Redhead	1,100	1,100	1,000	1,100	2,100	2,200				
Ring-necked	500	500	500	1,100	122	105	10	10		
Canvasback	1,100	1,100	1,500	1,100	1,300	1,300	10			
Scaup	1,500	1,200	1,500	1,300	100	100				
Goldeneye										
Bufflehead	125	125	100	125	100	100	122	1,000	1,000	55
Ruddy	200	200	200	200	200	200				
Other			5	4	5	6	8			
White-fronted teal							2			20
Wentworth teal	1	1	1	1	1	1				
Lost	2,500	2,500	1,400	1,300	1,600	1,600	100	100	200	125

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans				Principal feeding areas _____
Geese				_____
Ducks				Principal nesting areas _____
Coots				_____
				Reported by <u>D. F. Williams Jr.</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).

WATERFOWL

REFUGE Sea Island

MONTHS OF May 1 TO August 31, 1971

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
	Swans:									
Whistling	1	1	1	1	1	1	1	1	1	1
Trumpeter										
Geese:										
Canada	25	25	5	2	3	5	5	5	5	5
Cackling										
Brant										
White-fronted										
Snow	150	70	25	4	4	1	1	1	1	1
Blue	1	1	1	1	1					
Other										
Ducks:										
Mallard	4	4	4	4	4	4	4	14	14	14
Black	110	132	132	132	132	132	132	22	32	22
Gadwall	20	21	20	31	21	31	33	65	31	31
Baldpate										
Pintail										
Green-winged teal	50	50	50	2	2	2	2	2	2	3
Blue-winged teal	100	89	78	10	10	19	19	10	11	16
Cinnamon teal										
Noveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Red-breasted	4	4	4	4	4	4	4	4	4	4
Goose	50	50	25							

WATERFOWL
 (Continuation Sheet)

REFUGE _____

MONTHS OF _____ TO _____, 19__

(1) Species	(2) Weeks of reporting period								(3) Estimated	(4) Production	
	11	12	13	14	15	16	17	18	waterfowl	Broods	Estimated
									days use	seen	total
Swans:											
Whistling Trumpeter	1	1	1	1	1	1	1	1	153		
Geese:											
Canada	5	5	5	5	5	5	5	5	7		
Cackling Brant											
White-fronted											
Snow	1	1	1	1	1	1	1	1	3,456		
Blue											
Other											
Ducks:											
Mallard	14	24	14	14	14	14	14	14	1,222	2	10
Black	242	242	242	242	242	242	242	242	21,111	23	160
Gadwall	11	11	11	11	11	11	11	11	11,111	11	110
Baldpate											
Pintail											
Green-winged teal	2	2	2	2	2	2	2	2	1,113	1	1
Blue-winged teal	1	1	1	1	1	1	1	1	1,111	1	1
Cinnamon teal											
Shoveler											
Wood											
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

WATERFOWL
 (Continuation Sheet)

REFUGE _____

MONTHS OF _____ TO _____, 19 71

(1) Species	(2) Weeks of reporting period								(3) Estimated	(4) Production	
	11	12	13	14	15	16	17	18	waterfowl	Broods	Estimated
									days use	seen	total
Swans:											
Whistling	1	1	1	1	1	1	1	1	192		
Trumpeter											
Geese:											
Canada	5	5	5	5	5	5	5	5	7		
Cackling											
Brant											
White-fronted											
Snow	1	1	1	1	1	1	1	1	2,432		
Blue											
Other											
Ducks:											
Mallard	11	24	16	7	6	11	1	16	1,222	2	10
Black	242	272	272	272	270	275	275	272	21,111	25	160
Gadwall	11	11	11	11	11	11	11	11	1,111	11	110
Baldpate											
Pintail											
Green-winged teal	2	4	3	3	3	3	3	3	1,113	1	1
Blue-winged teal	1	1	1	1	1	1	1,170	1,170	17,174	2	1
Cinnamon teal											
Shoveler											
Wood											
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:									772	2	1

W A T E R F O W L

REFUGE Pea Island

MONTHS OF September 1 TO December 31, 19 71

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
	Swans:									
Whistling	1	1	1	1	1	1	1	1	1	1,045
Trumpeter										
Geese:										
Canada	8	8	10	11	16	22	169	369	500	1,779
Cackling										
Brant										
White-fronted										
Snow	1	1	1				3	27	131	379
Blue									10	10
Other										
Ducks:										
Mallard	6	6	5	2	2				10	25
Black	275	280	119	97	115	193	625	133	600	500
Gadwall	600	395	150	3	3					21
Baldpate				201	201	2,101	3,350	2,500	3,200	3,100
Pintail		35	57	512	610	1,025	3,150	3,200	5,000	4,200
Green-winged teal	500	1,125	2,915	4,314	2,980	650		1,500	2,000	1,350
Blue-winged teal	3,000	2,500	50	375	275	775	50	1,500	2,000	250
Cinnamon teal										
Noveler			10	3	5					
Wood										
Redhead										
Ring-necked									20	50
Canvasback										
Scaup										
Goldeneye										
Bufflehead										2
Ruddy							2	12		25
Other										
Red-breasted merganser		3								
European Merganser									1	
American Coot							40	779	360	500
										2,970

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

REFUGE Pea Island

MONTHS OF September 1 TO November 31, 19 71

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods : Estimated seen : total	
	11	12	13	14	15	16	17	18			
Swans:											
Whistling	1,000	2,300	141	50	32	50	70	79	21,130		
Trumpeter											
Geese:											
Canada	1,000	2,000	2,000	1,700	1,500	1,000	1,000	1,000	100,000		
Cackling											
Brant											
White-fronted											
Snow	7,000	7,000	3,000	3,100	4,700	1,700	1,000	6,000	100,000		
Blue	10	10	10	11	20	21	21	21			
Other											
Ducks:											
Mallard	2	5	5	17	10	10	10	10	1,000		
Black	1,000	1,000	1,200	1,000	1,000	1,000	1,000	1,000	20,000		
Gadwall		10	10	10	10	10	10	10	10,000		
Baldpate	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000		
Pintail	3,000	3,000	3,000	1,000	1,000	1,000	1,000	1,000	20,000		
Green-winged teal	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	20,000		
Blue-winged teal											
Cinnamon teal											
Shoveler	50	20	50	30	50	100	100	100	5,000		
Wood		1									
Redhead	6	6	6	6	6	6	6	6	1,000		
Ring-necked											
Canvasback	100	100	70	1,000	1,000	1,000	1,000	1,000	10,000		
Scaup	100	100	100	1,000					5,000		
Goldeneye											
Bufflehead	10	10	10	1,000	10	10	10	10	10,000		
Ruddy	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000		
Other											
Coot:	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000		
Total of waterfowl											
Produced eggs											
Total of waterfowl and eggs	1										

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	21,000	1,000		Principal feeding areas _____
Geese	37,000	10,000		Principal nesting areas _____
Ducks	1,000,000	10,000		Principal nesting areas _____
Coots	300,000	8,000		

Reported by George W. Peyton

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).

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	3	1/2/71 - 2/1/71	25 - 100	2	1,27
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow					

Reported by

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (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 Guliiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

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

Reported by

L. F. Williams

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (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 or 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 Scoliformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

	(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	3	4/25	3	4/1-25	3	70
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	1 1 1 1 1 1	4/25 4/25 4/25 4/25 4/25 4/25	1 1 1 1 1 1	4/1-25 4/1-25 4/1-25 4/1-25 4/1-25 4/1-25	1 1 1 1 1 1	70 70 70 70 70 70

Reported by *George W. Peyton*

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (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 Goliiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

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

Reported by *George W. Veston*

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (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 Graciiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

3-1751
Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge _____ Months of _____ to _____ 19__

(1) Species Common Name	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total Estimated Use
	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	
I. <u>Water and Marsh Birds:</u>										
I. <u>Shorebirds, Gulls, and Terns:</u>										

(over)

	(1)	(2)	(3)	(4)	(5)	(6)	
III. <u>Doves and Pigeons:</u>							
Mourning dove	20	9/24	20	9/1-12/31	20	12/30	2,440
White-winged dove							
IV. <u>Predaceous Birds:</u>							
Golden eagle							
Duck hawk	1	9/7	2	10/1-12/31	2	12/30	214
Horned owl							
Magpie							
Raven							
Crow Common	20	9/16	20	9/1-9/30	15	12/30	1,930
Fish Crow	12	3/5	12	9/1-12/31	12	12/30	1,461
Sharp Shinned Hawk	1	9/24	4	11/11-12/31	11	12/30	305
Cooper's Hawk	1	9/24	1	9/1-9/30	1	9/24	30
Red Tailed Hawk	1	9/24	1	9/1-12/31	1	12/30	122
Red-shouldered Hawk	1	9/24	1	9/1-12/31	1	12/30	122
Rough-legged Hawk	1	11/11	1	11/1-12/15	1	12/7	61
Marsh Hawk	1	9/16	12	11/1-12/31	12	12/30	793

Reported by *George W. Peyton*

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (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 migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Pea Island

Months of September 1

to December 31

19 71

(1) Species Common Name	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:										
Common Loon	50	12/30	50	12/15-12/31	50	12/30				800
Red-throated Loon	50	12/30	50	12/15-12/31	50	12/30				500
Horned Grebe	75	12/30	75	12/15-12/31	75	12/30				1,200
Pied-billed Grebe	22	9/16	55	11/1-12/31	55	12/30				4,677
Sannet	200	12/1	200	12/1-12/31	200	12/30				6,200
Double-crested Cormorant	20	9/16	300	11/25-12/31	300	12/30				12,300
Great Blue Heron	5	9/16	15	12/1-12/31	15	12/30				920
Green Heron	3	9/16	3	9/1-9/30	3	9/16				90
Little Blue Heron	28	9/16	28	9/1-9/30	9	12/30				1,668
Cattle Egret	77	9/16	77	9/1-9/30	77	9/16				2,310
Reddish egret	1	9/25	1	9/15-9/30	1	9/25				15
Common Egret	18	9/16	18	9/1-9/30	7	12/30				1,184
Snowy Egret	30	9/16	30	9/1-9/30	16	12/30				2,372
Louisiana Heron	20	9/16	20	9/1-9/30	6	12/30				1,152
Black-crowned Night Heron	40	9/16	40	9/1-12/31	40	12/30				4,800
American Bittern	2	9/16	8	11/15-12/31	8	12/30				520
Continued on page 2										
II. Shorebirds, Gulls, and Terns:										
American Oystercatcher	22	9/16	22	9/1-9/30	22	9/16				660
Semipalmated Plover	5	12/30	5	12/15-12/31	5	12/30				80
Black-bellied Plover	18	11/17	216	12/15-12/31	216	12/30				3,726
Common Snipe	2	11/17	10	12/1-12/31	10	12/30				330
Whimbrel	2	9/11	2	9/1-9/15	2	9/11				30
Willet	219	9/16	219	9/1-9/30	4	12/30				7,306
Yellowlegs	6	9/16	6	9/1-12/31	6	12/30				732
Dunlin	20	11/17	1300	12/1-12/31	1300	12/30				56,400
Long-billed Dowitcher	10	9/16	10	9/1-12/31	10	12/30				1,220
Semipalmated Sandpiper	50	12/30	50	12/15-12/31	50	12/30				2,770
Hudsonian Godwit	1	9/11	1	9/1-9/15	1	9/11				15
Sanderling	291	9/16	2250	12/1-12/31	2250	12/30				36,231

3-1751
Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Pea IslandMonths of September 1to December 3119 71

(1) Species Common Name	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
<u>I. Water and Marsh Birds:</u>										
Glossy Ibis	40	9/16	40	9/1-9/30	3	12/30				1,476
King Rail	3	12/30	3	12/1-12/31	3	12/30				93
Clapper Rail	2	9/16	4	11/15-12/31	4	12/30				338
Black Rail	1	11/15	8	12/1-12/31	8	12/30				278
Sora	4	9/16	4	9/1-12/31	4	12/27				488
<u>II. Shorebirds, Gulls, and Terns:</u>										
American Avocet	125	9/16	125	9/1-9/30	30	11/17				4,680
Black-necked Stilt	5	9/16	5	9/1-9/30	5	9/16				150
Great Black-backed Gull	18	9/16	600	11/1-12/31	600	12/30				37,698
Herring Gull	151	9/16	900	12/1-12/31	900	12/30				41,641
Ring-billed Gull	58	9/16	825	12/1-12/31	825	12/30				30,853
Laughing Gull	380	9/16	380	9/11-9/30	10	12/30				12,504
Black-legged Kittiwake	15	12/30	15	12/15-12/31	15	12/30				465
Common Tern	160	9/16	160	9/1-9/30	9	12/30				5,628
Royal Tern	207	9/16	207	9/1-9/30	53	12/30				10,810
Black Skimmer	229	9/16	229	9/1-9/30	229	9/16				6,870
Sandwich Tern	15	9/16	15	9/1-9/30	15	9/16				450
Least Tern	9	9/16	9	9/1-9/30	9	9/16				270
Gull-billed Tern	3	9/16	3	9/1-9/30	3	9/16				90

(over)

	(1)	(2)	(3)	(4)	(5)	(6)	
III. <u>Doves and Pigeons:</u>							
Mourning dove							
White-winged dove							
IV. <u>Predaceous Birds:</u>							
Golden eagle							
Duck hawk							
Horned owl							
Magpie							
Raven							
Crow							
Pigeon Hawk	1	9/25	2	11/1-12/31	2	12/30	183
Sparrow Hawk	20	9/25	20	9/1-9/30	12	12/30	1,704
Barn Owl	4	9/25	4	9/1-12/31	2	12/30	436
Screech Owl	1	9/10	2	9/1-12/31	2	12/30	244
Saw-whet Owl	1	12/30	1	9/1-12/31	1	12/30	122

Reported by *George W. Peyton*

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (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 migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

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.

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

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Don Island For 12-month period ending August 31, 1971

Reported by George C. Peyton Title Assistant Game Warden

(1) Area or Unit Designation	(2) Habitat		(3) Use-days	(4) Breeding Population	(5) Production	
	Type	Acreage				
Unit 1 North boundary to New Inlet	Crops	45	Ducks	65,111	11	27
	Upland	339	Geese	197,935		
	Marsh	1,416	Swans			
	Water	7,970	Coots			
	Total	9,770	Total	263,046		
Unit 2 New Inlet to North side of North Pond (Sound side)	Crops	0	Ducks	111,141	11	27
	Upland	220	Geese	110,031		
	Marsh	661	Swans	1		
	Water	7,550	Coots	77		
	Total	10,431	Total	221,950		
Unit 3 Pools 1 & 2 and New Inlet	Crops	55	Ducks	1,030,703	33	71
	Upland	230	Geese	710,027		
	Marsh	115	Swans	17,135		
	Water	580	Coots	270,227		
	Total	1,331	Total	2,028,192		
Unit 4 North side of North Pond to Oregon Inlet	Crops	0	Ducks	211,037	11	26
	Upland	300	Geese	212,241		
	Marsh	1,530	Swans	1		
	Water	8,110	Coots	3,115		
	Total	10,240	Total	426,494		
Totals for Refuge	Crops	100	Ducks	2,331,071	56	121
	Upland	1,115	Geese	1,987,463		
	Marsh	3,325	Swans	17,236		
	Water	20,530	Coots	270,227		
	Total	31,970	Total	4,606,097		
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

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.

3-1752
 (Form 2)
 (April 1946)

UPLAND GAME BIRDS

Refuge Pea Island

Months of January to April, 1971

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
			Number broods observed	Estimated Total		Hunting	For Re- stocking	For Research		
Common Name	Cover types, total acreage of habitat	Acres per Bird			Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Dikes, wax myrtle thickets, uplands and marshes (3,830 acres)	12			60% male 40% female				315	Approximately 30 birds were killed on the state highway by cars.

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.

3-1752
 (Form No. 2)
 (April 1946)

UPLAND GAME BIRDS

Refuge _____

Months of _____ to April 31, 1971

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
			Number broods observed	Estimated Total		Hunting	For Re- stocking	For Research		
Common Name	Cover types, total acreage of habitat	Acres per Bird			Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-neck Pheasant	Wikes, wax myrtle and bayberry thickets, bluffs, and marshes (3,838 acres)	9	15	190	57% male 43% female				118	Several birds were killed on the property.

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.

UPLAND GAME BIRDS

Refuge Pea Island

Months of September to December, 1971

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
			Number Broods Observed	Estimated Total		Hunting	For Re- stocking	For Research		
Common Name	Cover types, total acreage of habitat	Acres per Bird			Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-neck Pheasant	Dikes, waxmyrtle and bayberry thickets, upland, grassland and marsh (3830 acres)	9.3	0	0	60% male 40% female	0	0	0	390	Several birds killed on highway.

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.

3-175
Form W-3
(June 1945)

BIG GAME

Refuge Pea Island Calendar Year 1971

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

Remarks:

Reported by George W. Peyton

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 unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.
- (5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.
- REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge _____ Year ending April 30, _____

(1) Species Common Name	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion	
	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				
_____	_____	_____												
_____	_____	_____												
_____	_____	_____												
_____	_____	_____												

* List removals by Predator Animal Hunter

REMARKS:

Reported by N. F. Williams, Jr.

Refuge Ica Island Year 19 71

Botulism

Lead Poisoning or other Disease

Period of outbreak None noted

Kind of disease None noted

Period of heaviest losses _____

Species affected _____

Losses:

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

Number Affected Species	Actual Count	Estimated
_____	_____	_____
_____	_____	_____
_____	_____	_____

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

Number Recovered _____

(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Number lost _____

Source of infection _____

Areas affected (location and approximate acreage) _____

Water conditions _____

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

Food conditions _____

Condition of vegetation and invertebrate life _____

Remarks _____

Remarks _____

MONTHLY RECREATIONAL USE REPORT

Refuge name
Pea Island
 State
North Carolina

State Code 33 (1-2) Congressional District Code 01 (3-4) Refuge Code 240 (5-7) Report Yr. | Mo. Calendar Year 1971 Period 7/ (8-11)

(Card Columns). (12-13) (14-18) (19-25)				(Card Columns). (12-13) (14-18) (19-25)			
ACTIVITY	Code	VISITS FOR THE MONTH		ACTIVITY	Code	VISITS FOR THE MONTH	
		Total Number	Total Hours			Total Number	Total Hours
Hunting:				On-Site Programs	22	230	347
Big Game	01			*Miscellaneous Wildlife	23	61,566	107,238
Upland Game	02						
Waterfowl	03			Swimming	24	15,954	31,535
Other Migratory	04	8,100	24,300	Boating	25	89	3,216
Other	05			Water Skiing	26	135	135
Bow	06			Camping	27	3,040	53,124
Fishing:				Group Camping	28	1,444	36,384
Salt Water	07	160,684	481,473	Picnicking	29	4,689	4,985
Warm Water	08	2	8	Horseback Riding	30		
Cold Water	09	5,400	2,700	Bicycling	31	51	42
Environmental Education	10			Winter Sports	32		
Wildlife Photography	11	99	236	Fruit, Nut and Vegetable Collecting	33		
Wildlife Observation	12	113,263	53,177	*Miscellaneous Non-Wildlife	34	771,529	324,060
Conducted Programs	13			Peak Load Day	35	28,000	
Field Trials	14			Actual Visits	36	1,162,273	
Wildlife Trails	15	10,950	21,162				
Wildlife Tours/Routes	16	135	135	Fee Area Use	37		
Visitor Contact Stations	17	1,588	396	Number of Fee Areas	38		(14-18)
Camping (wildlife related)	18	2,865	51,024	Fee Collections	39	\$	
Picnicking (wildlife related)	19	5,123	5,123	Collection Costs	40	\$	
Wildlife Interpretive Center	20						
Off-Site Programs	21						

Refuge Sea Island Year 19 71

Collections and Receipts (Seeds, rootstocks, trees, shrubs)							Plantings (Marsh - Aquatic - Upland)							
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss	
Not Applicable														

- (1) Report agronomic farm crops on Form NR-8
- (2) C = Collections and R = Receipts
- (3) Use "S" to denote surplus

Remarks: _____

Total acreage planted:
 Marsh and aquatic _____
 Hedgerows, cover patches _____
 Food strips, food patches _____
 Forest plantings _____

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

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Pea Island County Dare State North Carolina

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water-fowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Common grass					95	113 tons	95	Winter browse for lease	95
								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				95
Hay - Wild				2. Acreage Cultivated as Service Operation				95

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 January through December, 1971

(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
Yellow Corn	175 bu.	0	175 bu.	0	0	175 bu.	175 bu.	0			
Common Bycrass	0	4,600 lb.	4,600 lb.		4,600 lb.		4,600 lb.	0			

(8) Indicate shipping or collection points Bycgrass seed was purchased from Carolina Feed and Seed, Elizabeth City, N. C.(9) Grain is stored at Pea Island Headquarters(10) Remarks Corn was used for goose trapping bait, and bycgrass was seeded for green browse

*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.

TIMBER REMOVAL

Refuge on Island

Year 19 71

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
				Not applicable				

Total acreage cut over.....

Total income.....

No of units removed B. F.
Cords.....
Ties.....

Method of slash disposal.....

ANNUAL REPORT OF PESTICIDE APPLICATION

02 1971
 Proposal Number: 1 - 71
 Reporting Year: 1971

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
10/10/71

10. Summary of results (continue on reverse side, if necessary)

This report is a summary of the results of a study conducted by Dr. William C. Campbell on the effects of spraying for the control of the pestification of the ...

The study was conducted in the ... area of the ... refuge. The results of the study are as follows:

1. The pestification of the ... area was reduced by ...

2. The ... of the ... area was improved by ...

3. The ... of the ... area was maintained by ...

4. The ... of the ... area was increased by ...

5. The ... of the ... area was decreased by ...

6. The ... of the ... area was increased by ...

7. The ... of the ... area was decreased by ...

8. The ... of the ... area was increased by ...

9. The ... of the ... area was decreased by ...

10. The ... of the ... area was increased by ...

ANNUAL REPORT OF PESTICIDE APPLICATION

Sea Island
 Proposal Number 2-71
 Reporting Year 1971

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6/2-7/2/71	Cattail (<i>Najas</i> <i>muscorum</i>)	Small isolated spots over entire refuge.	3	Dalman (2,4-Dichloro- acetic acid, sodium salt)	10 lb.	10 lb./acre	water 100 gal per ac.	air jet

10. Summary of results (continue on reverse side, if necessary)

(1) 6/2 first application of 1.0 (2) 6/2 first observation (3) 6/2 first effect noted (4) plant started turning yellow (5) 7/2 all apparent kill (6) 10-20% kill with no regrowth (7) chemical costs \$32., labor \$32., equipment \$4., total \$68.00, cost per acre \$22.67.