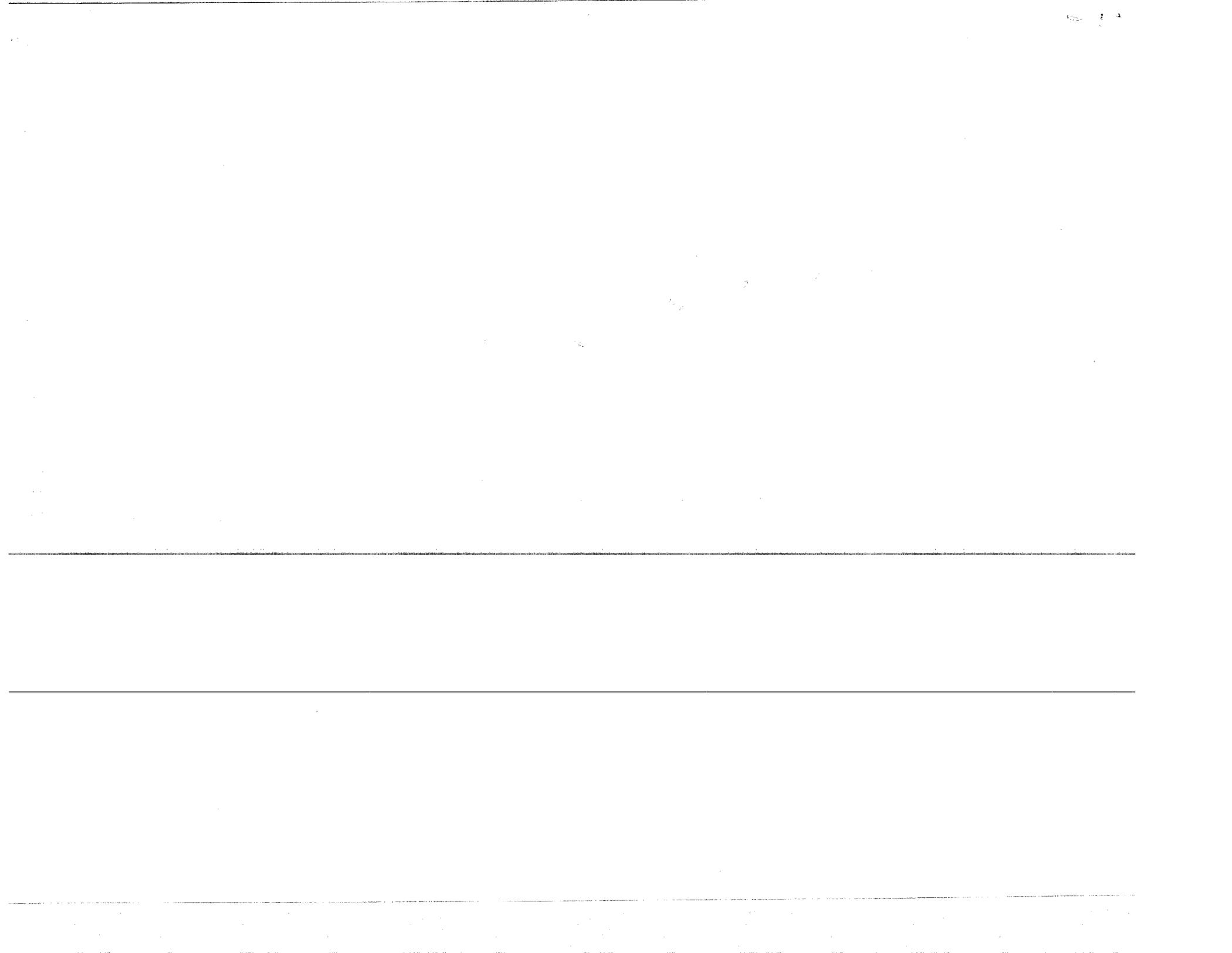


W A T E R F O W L

REFUGE Pea 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	5	5	5	5	5	5	5
Cackling										
Brant										
White-fronted										
Snow	150	75	25	4	4	1	1	1	1	1
Blue	1	1	1	1	1					
Other										
Ducks:										
Mallard	4	4	4	4	4	4	4	4	4	4
Black	100	132	132	132	132	152	192	232	292	292
Gadwall	90	90	200	315	315	315	365	465	665	865
Baldpate										
Pintail										
Green-winged teal	500	50	50	8	2	2	2	2	2	3
Blue-winged teal	100	25	25	10	10	10	10	10	10	16
Cinnamon teal										
Noveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Red-breasted Merganser	4	4	4	4	4	4	4	4	4	8
Coot	50	50	25							



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

WATERFOWL
 (Continuation Sheet)

REFUGE Pea Island

MONTHS OF July TO August 31, 1952

(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				
<u>Swans:</u>												
Whistling	1	1	1	1	1	1	1	1	123			
Trumpeter												
<u>Geese:</u>												
Canada	5	5	5	5	8	3	8	8	987			
Cackling												
Brant												
White-fronted												
Snow	1	1	1	1	1	1	1	1	2,043			
Blue									36			
Other												
<u>Ducks:</u>												
Mallard	14	14	14	14	14	14	14	14	1,222	2	10	
Black	292	292	292	292	280	275	275	275	27,777	23	160	
Gadwall	915	910	965	965	965	965	965	600	74,445	58	650	
Baldpate												
Pintail												
Green-winged teal	3	3	3	3	3	3	3	3	5,003	1	1	
Blue-winged teal	16	16	16	16	16	16	1,000	3,500	19,854	2	6	
Cinnamon teal												
Shoveler												
Wood												
Redhead												
Ring-necked												
Canvasback												
Scaup												
Goldeneye												
Bufflehead												
Ruddy												
Other												
Red-breasted Merganser	8	8	8	8	8	8	8	8	728	2	4	
<u>Coot:</u>									925			

(Over)

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans	123	1		Principal feeding areas <u>Around fresh water impoundments.</u>
Geese	3,066	176		
Ducks	129,029	4,400	831	Principal nesting areas <u>Around fresh water impoundments</u>
Coots	925	50		

Reported by George W. Leyton

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
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Pea Island

Months of May 1

to August 31

19 71

Page 1 of two pages

(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	
<u>I. Water and Marsh Birds:</u>										
Pied-billed Grebe	8	5/26	8	5/1-8/31	8	8/30				984
Brown Pelican	16	6/16	16	6/11-6/16	16	6/16				112
Glossy Ibis	50	5/26	260	8/1-8/15	150	8/30	1	35	130	10,970
American Bittern	1	8/27	1	8/25-8/31	1	8/27				7
Great Blue Heron	3	5/26	4	5/1-8/31	4	8/30				492
Common Egret	7	5/26	20	8/1-8/31	9	8/30	1	5	10	923
Snowy Egret	15	5/26	116	8/1-8/31	105	8/30	1	30	60	5,812
Louisiana Heron	15	5/26	108	8/1-8/15	22	8/30	1	30	45	3,352
Little Blue Heron	29	5/26	100	8/1-8/15	15	8/30	1	30	15	4,408
Cattle Egret	5	5/26	53	8/15-8/31	53	8/30	1	10	20	1,383
Green Heron	2	5/26	2	5/1-8/31	2	8/30				246
Black-Crowned Night Heron	34	5/26	127	7/15-8/1	36	8/30	1	35	70	5,696
Yellow-crowned Night Heron	1	5/30	2	5/30-8/31	1	8/1				188
Clapper Rail	2	8/30	4	8/15-8/31	2	8/30				64
Purple Gallinule	1	5/14		only sighting						4
<u>II. Shorebirds, Gulls, and Terns:</u>										
Great Black-backed Gull	10	5/15	10	5/1-8/31	5	8/30				1,230
Herring Gull	25	5/15	67	6/15-8/31	67	8/30				6,309
Ring-billed Gull	50	5/15	50	5/1-8/31	42	8/30				6,150
Laughing Gull	25	5/15	80	6/20-8/31	79	8/31				7,035
Gull-billed Tern	30	5/15	40	6/1-7/31	20	8/30	1	8	4	3,990
Royal Tern	3	5/15	3	5/1-8/31	3	8/30				369
Sandwich Tern	10	5/15	20	7/1-7/31	5	8/24				1,385
Common Tern	25	5/15	50	6/1-8/31	42	8/30	1	20	10	5,375
Least Tern	30	5/15	100	6/1-7/31	20	8/30	1	40	15	7,650
Black Skimmer	10	5/15	300	6/1-7/31	20	8/30	1	100	75	19,230
American Avocet	50	5/15	90	7/15-8/31	89	8/30			5	7,990
Black-necked Stilt	10	5/15	10	5/1-7/31	5	8/30				

Cont inued on page two
(over)

	(1)	(2)	(3)	(4)	(5)	(6)	
III. <u>Doves and Pigeons:</u>							
Mourning dove	5	5/15	5	5/1-8/31	5	8/30	615
White-winged dove							
IV. <u>Predaceous Birds:</u>							
Golden eagle							
Duck hawk							
Horned owl							
Magpie							
Raven							
Fish Crow	25	5/15	30	5/1-8/31	28	8/30	3,690
Marsh Hawk	1	6/15	1	5/1-8/31	1	8/25	92
Osprey	1	5/18	1	5/1-8/31	1	8/5	123
Sparrow Hawk	1	5/15	1	5/1-5/30	1	5/15	30
Barn Owl	1	5/6	1	5/1-8/31	1	8/2	123

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 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						
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow						

Reported by *George W. Weston*

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.

3-1752
 (Form NR-2)
 (April 1946)

UPLAND GAME BIRDS

Refuge Red Bluff

Months of July to August 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	Dikes, wax myrtle and bayberry thickets, uplands, and marshes (3,830 acres)	9	15	150	60% male 40% female				415	Several birds were killed on the highway.

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.

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

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

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Pea Island For 12-month period ending August 31, 19 71

Reported by George W. Payton Title Assistant Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type Acreage	(3) Use-days	(4) Breeding Population	(5) Production
Unit 1	Crops 45	Ducks 65,173	11	27
South Boundary	Upland 339	Geese 197,935		
to New Inlet	Marsh 1,216	Swans		
	Water 7,970	Coots		
	Total 9,525	Total 263,353	11	27
Unit 2	Crops 0	Ducks 111,461	11	27
New Inlet to	Upland 220	Geese 130,930		
North Dike of	Marsh 664	Swans 97		
North Pond	Water 9,550	Coots 770		
(Sound side)	Total 10,434	Total 295,352	11	27
Unit 3	Crops 55	Ducks 1,638,885	393	731
Pools 1 & 2	Upland 236	Geese 756,527		
and New Field	Marsh 415	Swans 17,135		
	Water 530	Coots 270,129		
	Total 1,331	Total 2,682,653	393	731
Unit 4	Crops 0	Ducks 215,539	11	26
North Dike of	Upland 320	Geese 202,917		
North Pond to	Marsh 1,530	Swans 56		
Oregon Inlet	Water 8,100	Coots 3,185		
	Total 10,290	Total 421,721	11	26
Totals for Refuge	Crops 100	Ducks 2,034,281	435	831
	Upland 1,115	Geese 1,337,433		
	Marsh 3,825	Swans 17,261		
	Water 26,500	Coots 274,084		
	Total 31,530	Total 3,663,079	435	831
	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.

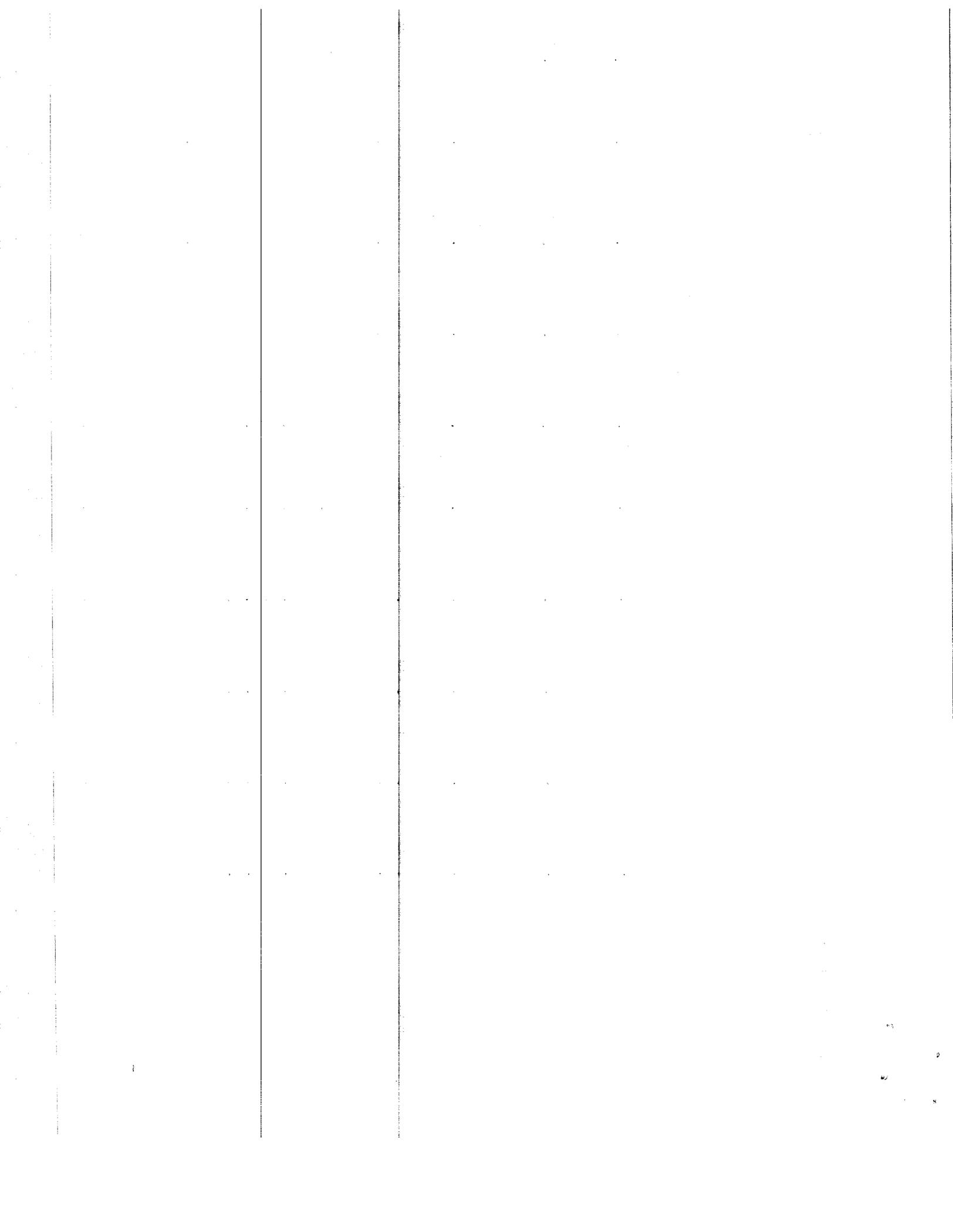
- (1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total 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.

WATERFOWL

REFUGE Pea Island MONTHS OF January TO April, 1971

Species	(1)									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling	80	80	5	8	8	8	2	19	29	57
Trumpeter										
Geese:										
Canada	3,025	3,050	2,572	2,756	3,125	3,125	1,006	1,870	2,050	1,085
Cackling										
Brant										
White-fronted	7,720	7,800	9,795	8,671	8,225	8,225	4,230	3,183	3,015	2,335
Blue	35	35	35	28	30	30		5	10	10
Other										
Ducks:										
Mallard	55	55	50	65	105	105	21	15	5	960
Black	2,500	2,500	2,100	1,766	1,795	1,795	1,015	1,060	1,020	960
Gadwall	100	125	125	179	171	171	15	87	90	90
Baldpate	500	500	309	100	50	50	10	10	59	500
Pintail	2,500	2,500	1,380	1,286	600	600	350	58	59	
Green-winged teal	3,950	4,000	4,500	339	950	950	1,300	2,000	1,000	
Blue-winged teal										
Cinnamon teal										
Joveler	315	400	100	319	1,115	1,115	233	212	200	320
Wood										
Redhead	4,000	4,000	4,000	4,000	2,750	2,750	2,250			
Ring-necked	600	600	500	1,000	525	525	16	10		
Canvasback	1,125	1,125	1,522	1,600	1,500	1,500	10			
Scaup	1,200	1,200	1,300	1,300	550	550				
Goldeneye	125	125	100	125	100	100	122	1,200	1,000	25
Bufflehead	200	200	200	200	200	200				
Ruddy										
Other										
Hooded Merganser										
Red-breasted Merganser										
Common Teal	1	1	1	1	1	1	2			20
Coot	2,500	2,500	1,575	1,560	1,600	1,600	750	186	239	125

FILE COPY



WATERFOWL
 (Continuation Sheet)

REFUGE Poa Island NW Refuge

MONTHS OF January 1 TO April 31, 1971

(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	140	134	82	1	1	1	1	1	4,198			
Trumpeter												
Geese:												
Canada	1,060	695	676	467	300	100	100	43	176,567			
Cackling												
Brant												
White-fronted												
Snow	670	197	254	200	200	200	200	199	420,934			
Blue Ross	4	6	6	5	5	5	5	5	1,533			
Other				1	1				14			
Ducks:												
Mallard	4		2	2	2	2	2	2	3,167			
Black	635	673	650	429	100	200	150	115	125,936			
Gadwall	129	341	215	245	245	200	200	83	18,386			
Baldpate	20	37	20	20	20	20	14	14	12,900			
Pintail			2						52,045			
Green-winged teal	350	345	300	300	300	300	400	530	132,418			
Blue-winged teal	85	285	132	25	100	100	100	121	6,515			
Cinnamon teal												
Shoveler	120	230	120	100	100	75	50	1	34,719			
Wood									130,500			
Redhead	10	17							23,621			
Ring-necked									53,049			
Canvasback									35,790			
Scaup												
Goldeneye												
Bufflehead	125	15	5	33					21,775			
Ruddy									7,400			
Hooded Merganser									147			
Other									546			
Red-breasted Merganser	3		13	15	25							
Coot:	275	545	279	175	175	150	150	135	89,348			
Common Teal									42			

(Over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	<u>4,198</u>	<u>140</u>	<u> </u>	Principal feeding areas <u>Entire refuge</u>
Geese	<u>601,160</u>	<u>12,372</u>	<u> </u>	
Ducks	<u>660,366</u>	<u>17,331</u>	<u> </u>	Principal nesting areas <u>Not applicable</u>
Coots	<u>89,348</u>	<u>2,500</u>	<u> </u>	
				Reported by <u>D. F. Williamson, 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).

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

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Pea Island

Months of January

to April

19 71

Page 1 of two pages.

(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	
<u>I. Water and Marsh Birds:</u>										
Common Loon	90	1/6/71	90	1/01-2/28	5	4/28/71				5,615
Red-throated Loon	40	1/6/71	40	1/01-2/28	3	3/28/71				2,543
Horned Grebe	30	1/6/71	30	1/01-3/20	2	4/28/71				2,452
Pied-billed Grebe	72	1/6/71	72	1/01-3/20	8	4/28/71				6,016
Double-crested Cormorant	400	3/1/71	400	3/01-3/31	75	4/28/71				14,650
Great Blue Heron	3	1/6/71	10	3/01-4/30	10	4/28/71				787
Green Heron	1	2/1/71	3	3/01-4/30	3	4/28/71				211
Little Blue Heron	1	2/1/71	12	4/01-4/30	12	4/28/71				419
Cattle Egret	5	3/1/71	6	4/01-4/30	6	4/28/71				335
Common Egret	2	1/6/71	5	4/01-4/30	5	4/28/71				330
Snowy Egret	3	1/6/71	10	4/01-4/30	10	4/28/71				570
Louisiana Heron	7	1/6/71	16	4/01-4/30	16	4/28/71				1,040
Black-crowned Night Heron	23	1/6/71	35	3/15-4/30	35	4/28/71				3,772
American Bittern	3	1/6/71	3	1/01-4/30	3	4/28/71				360
Glossy Ibis	1	1/6/71	26	3/15-4/30	26	4/28/71				1,270
Clapper Rail	4	1/6/71	4	3/15-4/30	1	4/28/71				342
<u>II. Shorebirds, Gulls, and Terns:</u>										
American Oystercatcher	3	3/4/71	8	3/15-4/30	8	4/01/71				413
Killdeer	28	1/6/71		Only sighting						196
Black-bellied Plover	63	1/6/71	63	1/01-3/31	9	4/28/71				5,940
Common Snipe	10	2/1/71	25	2/11-4/30	25	3/31/71				1,610
Spotted Sandpiper	10	4/28/71	10	4/1-4/30	10	4/28/71				300
Willet	1	1/6/71	126	4/1-4/30	126	4/28/71				3,870
Greater Yellowlegs	19	1/6/71	19	4/01-2/28	2	4/28/71				1,243
Lesser Yellowlegs	3	1/6/71	25	4/01-4/30	25	4/28/71				1,020
Dunlin	185	1/6/71	500	4/01-4/30	500	4/28/71				18,150
Sanderling	200	1/6/71	200	1/01-4/30	200	4/28/71				24,000
American Avocet	47	1/6/71	75	4/01-4/30	75	4/28/71				8,730

Continued on page two
(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. <u>Doves and Pigeons:</u>									
Mourning dove	3	1/06/71	20	2/28-4/30	20	4/25/71			1,397
White-winged dove									
IV. <u>Predaceous Birds:</u>									
Golden eagle									
Duck hawk			5	4/5-4/20	Estimated use				75
Horned owl									
Magpie									
Raven									
Fish Crow	5	2/24/71	14	3/1-4/30	14	4/28/71			889
Sharp-shinned Hawk	2	1/06/71	2	1/1-2/28	2	2/25/71			118
Cooper's Hawk	2	1/06/71	2	1/1-2/28	1	2/25/71			118
Red-tailed Hawk	2	1/06/71	2	1/1-1/15	1	1/14/71			30
Marsh Hawk	15	1/06/71	15	1/1-3/15	2	4/25/71			1,202
Osprey	1	4/20/71	2	4/20-4/30	2	4/29/71			20
Pigeon Hawk	2	1/06/71	2	1/1-4/25	1	4/25/71			240
Sparrow Hawk	10	1/06/71	10	1/1-3/1	2	4/27/71			711
Short-eared Owl	1	1/08/71	2	1/1-4/1	1	4/25/71			240

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 Gruliiformes)
 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.

ENS (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 Pea Island

Months of January

to April

19 71

Page 2 of two Pages.

(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	
<u>I. Water and Marsh Birds:</u>										
Virginia Rail	2	1/06/71	4	2/1-2/31	1	4/1/71				328
Sora Rail	4	1/06/71	10	4/1-4/30	10	4/1/71				860
Black Rail	5	2/1/71	5	1/1-3/31	5	3/15/71				450
Common Gallinule	1	4/28/71		Only sighting						7
<u>II. Shorebirds, Gulls, and Terns:</u>										
Black-necked Stilt	10	4/05/71	10	4/1-4/30	10	4/28/71				300
Great Black-backed Gull	100	1/06/71	100	1/1-2/28	31	4/28/71				7,721
Herring Gull	3,150	1/06/71	3,150	1/1-2/28	183	4/28/71				197,013
Ring-billed Gull	4,101	1/06/71	4,101	1/1-2/28	134	4/28/71				250,133
Laughing Gull	34	1/06/71	156	3/15-4/30	156	4/28/71				9,622
Gull-billed Tern	22	4/16/71	22	4/15-4/30	22	4/28/71				330
Forster's Tern	44	1/06/71	44	1/1-3/15	44	3/10/71				3,256
Common Tern	15	4/16/71	15	4/15-4/30	15	4/28/71				225
Least Tern	30	4/16/71	30	4/15-4/30	30	4/28/71				450
Royal Tern	58	4/16/71	58	4/15-4/30	58	4/28/71				870

(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					

Reported by

H. F. Williams Jr.

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 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.

UPLAND GAME BIRDS

Refuge _____ Months of _____ to _____, 19__

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
						Hunting	For Re- stocking	For Research		
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'vd.	Estimated Total	Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Dikes, wax myrtle thickets, islands and marshes. (3, 13 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.

3-1754

Form NR-4

(June 1945)

SMALL MAMMALS

Refuge Pea IslandYear ending April 30, 1971

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion
								Share Trapping			Total Refuge Furs Shipped	Furs Donated	
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Permit Number	Trappers Share	Refuge share			
Muskrat	Impoundments and adjacent marsh (1,500 acres)	2			Not applicable								750
Otter	Entire refuge and associated tidal creeks (5,880 acres)	588			Not applicable								10
Nutria	Impoundments and adjacent marsh (1,500 acres)	60			Not applicable								25
Mink	Entire refuge and associated tidal creeks (5,880 acres)	588			Not applicable								10

* List removals by Predator Animal Hunter

REMARKS:

Reported by

H. F. Williamson, Jr.

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.

PEA ISLAND NATIONAL WILDLIFE REFUGE

Narrative Report

January 1 to December 31, 1970

Refuge Staff

N. F. WILLIAMSON, JR.
G. W. PEYTON
Harvin C. TOLER

Refuge Manager
Assist. Refuge Manager
Maintenanceman

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BUREAU OF SPORT FISHERIES AND WILDLIFE

INTER-OFFICE TRANSMITTAL

<input type="checkbox"/> Director, _____		<input checked="" type="checkbox"/> Regular Mail
<input checked="" type="checkbox"/> Regional Director, <u>Atlanta, Georgia</u>		<input type="checkbox"/> Air Mail
<input type="checkbox"/> Project Leader, _____		<input type="checkbox"/> Action
<input type="checkbox"/> _____		<input type="checkbox"/> Information
From	Office	Date
Refuge Manager	Pea Island	1/29/71

Subject

Narrative Report Form - NR-1B (3 copies)

Corrected form is attached as per Mr. Stieglitz's memo of 1/25/71.

3-1908
(Rev. 6/63)

(Attach securely to material to be transmitted & mail through regular channels)

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VII. OTHER ITEMS
I. Safety
A. Items of Interest
B. Photographs
C. Credits
Signature

I. GENERAL

A. Weather Conditions.

The year started off with abnormally cold weather. A low of 10 degrees was recorded on January 23, breaking the previous low of 14 degrees for this date set in 1886. The temperature was never above freezing from January 21 through January 24. These low temperatures, accompanied by 25-30 MPH winds, made it kind of cool out here on the islands.

Light snow flurries hit the area on February 26 and March 16. A total of about four inches of snow fell in both storms.

Weather was about normal until August 17, when a low depression area developed about 30 miles due west of the refuge. This low created a small storm with winds up to 65 MPH causing flooding of the marsh by sound water.

Weather for August, September and October was hot, dry and windy. Temperatures for November and December were above normal with light winds.

Except for the extreme cold in January and February, temperatures were near normal. The low was 10 degrees and the high was 97 degrees.

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.	3.21	4.80	-1.59	68	10
Feb.	6.27	4.64	+1.63	64	18
Mar.	4.76	2.88	+1.88	72	28
Apr.	5.18	3.14	+2.04	77	37
May	2.05	3.95	-1.90	92	49
June	10.91	4.56	+6.45	92	62
July	7.44	6.15	+1.29	92	62
Aug.	2.95	6.00	-3.05	97	67
Sept.	3.96	5.19	-1.23	94	48
Oct.	3.72	3.34	+ .38	83	43
Nov.	5.35	3.12	+2.23	72	25
Dec.	3.16	3.53	- .36	72	23
Total	51.52	51.30	+ .22	97	10

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

B. Habitat Conditions.

1. Water

During the cold weather in January, the fresh water impoundments froze over twice. Pamlico sound froze over on January 21-22, something that does not occur very often.

Scant rainfall and high evaporation during the months of August, September, October and the first of November dried the fresh water impoundments up to such an extent that about thirty percent of the impoundment floors were exposed. Both impoundments were partially filled in November by heavy rains and high sound tides which were allowed to flow into the impoundments by opening the water control gates. Sound water also increased the salinity in both impoundments considerably.

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

Water Salinity Tests During 1970 (Readings in % sea strength)

<u>Date</u>	<u>North Pond</u>			<u>South Pond</u>			<u>Pamlico Sound</u>	
	<u>North</u> <u>End</u>	<u>At</u> <u>Gauge</u>	<u>Gauge</u> <u>Reading</u>	<u>At</u> <u>Gauge</u>	<u>West</u> <u>Side</u>	<u>Gauge</u> <u>Reading</u>	<u>Tidal</u> <u>Creek</u>	<u>Salt</u> <u>Pond</u>
1/19	7.76	7.45	2.04	4.97	4.35	1.74	63.64	68.30
2/18	6.36	6.68	2.38	3.26	3.26	2.14	58.22	62.09
3/16	6.05	5.70	2.12	3.10	3.10	1.90	72.40	57.44
4/20	5.74	5.59	2.06	2.95	2.95	2.10	69.85	68.30
5/14	6.36	6.21	1.86	3.57	3.26	1.74	47.35	62.09
6/18	7.76	7.92	1.30	5.43	4.50	1.32	63.64	63.64
7/14	8.07	7.61	1.38	5.43	8.85	1.30	52.78	58.22
8/14	8.85	6.21	1.08	6.83	7.30	1.08	77.62	49.67
9/21	10.10	9.79	0.96	11.65	11.80	0.68	77.62	58.22
10/13	10.25	11.49	dry	9.16	11.41	dry	85.38	56.66
11/17	9.73	10.72	1.68	10.25	13.66	1.88	60.54	63.64
12/15	11.02	10.87	1.58	11.49	13.97	1.60	65.19	68.30

Higher salinity readings beginning in September reflects the introduction of water from Pamlico Sound in August.

2. Food and Cover

Approximately 95 acres of ryegrass, 40 acres at the south end of the refuge and 55 acres in New Field, were planted the first of November. Both Canada and snow geese have used browse heavily.

Production of native foods was fair to good on most of the refuge.

Vegetation surveys were run in North, South, 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 totaled 10,500 feet along which 354 stops were made with 1,770 points being sampled. A comparison of 1970 data to previous years are as follows.

TABLE 1

North Pond Vegetation Transect Line Comparison			
Species or Group	1970 Percent	1969 Percent	1968 Percent
Muskgrass (<i>Chara</i> sp.)	69.7	76.6	87.6
Sago Pondweed (<i>Potamogeton</i> <i>pectinatus</i>)	4.9	15.2	10.6
Spikerushes (<i>Eleocharis</i> spp.)	3.5	0.6	0.9
Dwarf Spikerush (<i>E. parvula</i>)	0.9	0.0	0.0
Bare ground	21.0	7.5	0.9
Totals	100.0	100.0	100.0

Table 1 shows an increase in the amount of bare ground. The only plant to show an increase was the spikerushes. Seven and three tenths percent of the plants found had good value and 72.7 percent had fair value as waterfowl food. Overall food production, good.

South Pond

After suffering a drastic drop in 1969, muskgrass increased with other species remaining about stable. Of the plants in this pond, 11.3 percent had high food value, 87.6 percent had fair food value and 1.1 percent had no food value for waterfowl. Production of submergents was fair, but good production of panicums, millets, and giant foxtail occurred on some of the islands in this pond. See table 2 for summary of data.

TABLE 2

South Pond Vegetation Transect Line Comparison			
Species or Groups	1970 Percent	1969 Percent	1968 Percent
Muskgrass (<u>Chara</u> spp)	55.6	15.1	81.1
Spikerushes (<u>Eleocharis</u> spp.)	9.8	8.1	4.6
Water Hyssop (<u>Racopa</u> <u>mannieria</u>)	8.0	6.8	1.1
Sago Pondweed (<u>Potamogeton</u> <u>pectinatus</u>)	5.3	6.4	8.5
Dwarf Spikerush (<u>E.</u> <u>parvula</u>)	3.6	4.2	0.0
American Threesquare (<u>Scirpus</u> <u>americanus</u>)	0.6	0.3	0.3
Bare ground	16.3	58.1	3.6
Totals	100.0	100.0	100.0

TABLE 3

Salt Pond Vegetation Transect Line Comparison			
Species or groups	1970 Percent	1969 Percent	1968 Percent
Glasswort (<u>Salicornia</u> sp.)	24.9	19.0	15.4
Filamentous Algae	11.4	13.8	35.8
Saltmarsh Cordgrass (<u>Spartina</u> <u>alterniflora</u>)	2.9	2.3	1.5
Saltgrass (<u>Distichlis</u> <u>spicata</u>)	1.5	1.2	---
Dwarf spikerush (<u>E.</u> <u>parvula</u>)	0.5	0.2	---
Fleabane (<u>Pluchea</u> <u>camphorata</u>)	0.3	---	---
Seaside Goldenrod (<u>Solidago</u> <u>sempervirens</u>)	0.3	---	---
Horseweed (<u>Conyza</u> <u>canadensis</u>)	0.1	---	---
Aster (<u>Aster</u> sp.)	0.1	---	---
Miscellaneous	---	0.9	5.3
Bare ground	58.0	62.6	42.0
Total	100.0	100.0	100.0

Very little change in vegetation in Salt pond from last year. Food value for species was rated as high for 1.1 percent, fair for 66.0 percent and poor for 32.9 percent. Area produced very little food.

TABLE 4

New Field Vegetation Transect Line Comparisons			
Species or Group	1970 Percent	1969 Percent	1968 Percent
Saltmeadow Cordgrass (<u>Spartina patens</u>)	22.5	22.9	22.2
Wax Myrtle (<u>Myrica cerifera</u>)	7.8	2.8	0.0
Wild Millet (<u>Echinochloa crusgalli</u>)	7.6	0.5	0.2
Horseweed (<u>Conyza canadensis</u>)	6.8	13.9	5.8
Spikerushes (<u>Eleocharis spp.</u>)	5.3	1.2	2.4
Groundsel-bush (<u>Baccharis halimiflora</u>)	4.7	2.6	6.6
American Three-square (<u>Scirpus americanus</u>)	4.1	6.6	1.8
Broomsedge (<u>Andropogon virginicus</u>)	3.2	1.0	0.0
Flat Sedge (<u>Cyperus spp.</u>)	3.1	1.7	4.1
Panic Grasses (<u>Panicum spp.</u>)	3.0	4.3	1.1
Chickweed (<u>Stellaria media</u>)	2.7	0.0	0.0
Saltmarsh Cordgrass (<u>Spartina alterniflora</u>)	2.7	7.6	11.1
Seaside Goldenrod (<u>Solidago sempervirens</u>)	2.6	0.7	0.0
Salterass (<u>Distichlis spicata</u>)	2.5	2.8	3.7
Morning Glory (<u>Ipomea spp.</u>)	2.1	0.2	1.3
Glasswort (<u>Salicornia sp.</u>)	1.6	0.9	1.1
Eleocharis (<u>Pluchea camphorata</u>)	1.4	0.9	1.0
Smartweed (<u>Polygonum Sp.</u>)	1.3	2.2	0.0
Miscellaneous spp.	3.4	5.7	15.6
Bare Ground	11.8	21.8	22.0
Totals	100.2	100.1	100.0

New Field is made up of three distinct bands. The highest band is cultivated and sown to ryegrass annually. The middle band is highly infested with saltmeadow cordgrass, wax myrtle, horseweed, groundsel-bush, and broomsedge and produces very little food of any value to wildlife. The lower band contained less bare ground this year than in previous years. Bare areas are filling in with glasswort and in some cases with saltmarsh cordgrass. Of the plants found in New Field, 18.7 percent have high food value, 23.3 percent fair food value and 58.0 percent had no food value for waterfowl.

No quantitative data were obtained on food production. However, both ponds, New Field and the natural marshes all produced good quantities of available waterfowl foods. Good stands of S. patens and S. alterniflora and some S. robustus were produced in the salt marshes on the sound. Fair stands of S. robustus, S. americanus, millet and panicums were produced in the fresh water marshes.

An abundant crop of dune peas was produced on the higher areas of the refuge. Bayberry and wax myrtle produce an excellent crop of berries again this year.

Shoals in Publico Sound produced an excellent stand of submergents.

II. WILDLIFE

A. Migratory Birds

1. Waterfowl

Total waterfowl use days for 1970 increased compared to 1969. Use days were as follows.

Species	Use Days	
	1969	1970
Swans	22,891	15,903
Geese	1,020,804	1,122,736
Ducks	1,218,559	1,764,245
Coots	105,193	213,475
TOTAL	2,435,088	3,116,359

Overall waterfowl populations on the refuge increased, an increase of some 680,000 usedays. Snow goose use days were up approximately 130,000, but Canada goose use days dropped about 100,000 for the fall period.

Duck use days were up with increased use days for green-winged teal, pintail, redhead, canvasback and ringnecked. Black duck, gadwall and blue-winged teal use days declined.

Duck production on the refuge increased again in 1970. Production was up from 340 birds in 1969 to 500 birds in 1970, a 47 percent increase. Production included 3 mallards, 4 blue-winged teal, 110 blacks and 383 gadwalls.

One common teal was observed during the christmas bird count on December 30. On December 30, 1969, a common teal was seen in the same area.

2. Wading Birds, Gulls, Terns and Shore Birds.

A large rookery with several species of wading birds, located in north pond again in 1970. Estimated production was 90 glossy

ibis, 15 common egrets, 28 snowy egrets, 39 Louisiana herons, 32 little blue herons, 20 cattle egrets and 45 black-crowned night herons.

The first shorebird nesting on the refuge beaches in several years was recorded this year. One large colony of black skimmers, with a few royal and common terns mixed in, nested on the beach just south of refuge headquarters. The colony was first located in July and remained through October.

Willetts and black-necked stilts were here in good numbers during the summer. Several young of both species were observed.

Large numbers of both gulls and terns used the refuge, but no major concentration of nesting birds was found.

B. Upland Game Birds

Other than a few doves occasionally, the ring-necked pheasant is the only upland game bird found on the refuge. We have an estimated population of about 375 birds on the refuge. Up to 50 birds have been observed while driving around the refuge dikes, South Pond, North Pond, and New Field. Numerous pheasants were killed along the highway this year.

C. Big Game Animals

None occurs on the refuge.

D. Fur Animals, Predators, Rodents and Other Mammals

Muskrat, otter, nutria and mink are all found on the refuge. The muskrat population seems high, but down from a year ago. Rats are not seen as often along dikes or in the marsh. Road kills along the highway are high. We had seventy recorded kills from the refuge office to Oregon Inlet in 1970. No records were kept for kills south of the office.

Otter slides and droppings are seen frequently, but otter are seldom seen. One sighting in North Pond this year.

Nutria sighting decreased this year, one sighting in North Pond, one in New Field and two in South Pond.

Feral cats have been observed several times. Several cats have been killed on the highway this year.

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

Several species of hawks were observed on the refuge this year, with the marsh and sparrow hawks being the most abundant. Other hawks observed were cooper's, sharp-shinned, redtail, pigeon, rough-legged and peregrine falcon.

Eagles were not seen on the refuge this year, but some were in the general area. Two immature balds were seen on Bodie Island just north of the refuge. One injured immature bald was caught in Currituck county and released at Pungo Refuge.

One osprey was seen several times during the summer fishing in the North Pond. One osprey nest was located on Hatteras Island this year near Buxton.

One road killed barn owl was found on the refuge. No other sightings for this specie. Short-eared owls were observed several times during the year. One saw-whet owl found just north of the refuge. Possibly a few on the refuge.

Fish crows are found here throughout the year. Population is not considered to be too high.

F. Other Birds

The 1970 Christmas bird count was made December 30, 1970, by the Carolina Bird Club. A total of 103 species were found on the refuge. Several species observed are rare for the area and are of particular interest. One greater shearwater, one common eider, one kittiwake, one common teal and one great cormorant were observed on the refuge. The great cormorant had never been reported in North Carolina before.

G. Fish

Both sport and commercial fishing were outstanding along the refuge beach this year. Normal catches of small bluefish, sea mullet and spot occurred in the spring and summer. During late summer and early fall, excellent catches of gray and speckled trout were made on the beach and in Pamlico Sound. From about Thanksgiving until January, big bluefish, 23+ pounds, and big rockfish, 50 pounds and up, were in the area. Litterly tons of fish were caught in the surf. Commercial fishermen caught so many fish they ruined the market. One haul, with a 3,000 foot net, produced some 56,000 pounds of rockfish and 11,000 pounds of bluefish. One fish house in Nags Head processed 110,000 pounds of rock fish in a two day period.

H. Reptiles

Snapping turtles are seen occasionally in the fresh water ponds.

Diamondback terrapins are abundant in the sound and tidal creeks.

Occasionally a black racer or a water snake is seen. No poisonous snakes occur on the refuge.

I. Diseases

One bird was found dead on the refuge, cause unknown.
d.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

Erected a new three stall equipment shed. Shed is located on wide berm of South Pond Dike.

Erected bases for two new entrance signs and one headquarters sign. Bases were constructed from Grab Orchard stone and look real nice.

Landscaped comfort station site and residence. A total of 480 yards of 419 Tifton Bermuda, 6 Euonymus, 42 Pittosporum and 40 Yucca plants were used. Sod was laid out in strips, one foot wide with one foot open area. Grass did real well, most open areas were partially covered at end of growing season. Shrubs did not fare as well. Several were taken by people and most remaining plants died. Yucca did well, that is what was not pulled up or taken by people.

Constructed bulkhead at watercontrol structure in New Field, both inlet and outlet.

Renovated both observation platforms on ocean dunes and North Pond.

Partially constructed a ten car parking lot at north pond. Approximately 3,000 yards of fill was put in place. Fill will be leveled and covered with a four inch layer of marl.

Preventive maintenance to vehicles, air cooled engines, pumps, boats, outboard motors, disk and crawler tractor. Other maintenance chores included minor repairs and painting buildings as required, mowing roads and dikes and disking fire lanes.

B. Plantings

1. Aquatics and Marsh Plants

None.

2. Trees and Shrubs

The following shrubs were used for landscaping purposes. Forty-two Pittosporum, 6 Euonymus and 40 Yucca plants.

Shrubs were purchased from a local nursery. Plants were potted and were in good condition. Because plants were set in deep sand and drought conditions existed much of the summer, the survival rate was poor.

Yucca plants were transplanted from an old hunting lodge site on the refuge. Plants were in good condition and survival rate was high.

3. Upland Herbaceous Plants

None.

4. Cultivated Crops

A total of 95 acres of common ryegrass were planted for green browse this year. Fifty-five acres were planted in New Field and forty acres were planted on the south end of the refuge. Rye-grass was planted at the rate of 50 pounds of seed with 400 pounds of high analysis fertilizer per acre.

Due to drought conditions, planting was delayed until late October. Because of this late planting date, browse production was below normal. All browse has been utilized by geese.

C. Collections and Receipts

Shelled corn was obtained from both Pungo and Backbay Refuges, 175 bushels and 20 bushels respectively. Corn was used in the refuge's banding program.

D. Control of Vegetation

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

E. Planned Burning

No control burning conducted on the refuge in 1970.

F. Fires

One small grass fire on the south end of the refuge occurred on September 5. Approximately 0.6 acre was burned, denuding a small section of ocean dune. Other than burning grass off dune, no damage was done.

IV. RESOURCES MANAGEMENT

A. Grazing

No grazing on refuge.

B. Haying

No haying on 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 waters and along the beach, no refuge permit required for fishing.

F. Other Uses

None

V. FIELD INVESTIGATION OR APPLIED RESEARCH

The waterfowl nesting study was continued through the 1970 nesting season. Breeding pair counts showed an estimated 30 to 40 pairs of breeding waterfowl. These figures were not very realistic when compared to the number of broods seen and the number of young produced.

Six active gadwall nest were found and a total of 115 broods observed. An estimated 500 flying young (77% gadwall, 22% black, $\frac{1}{2}$ % mallard and $\frac{1}{2}$ % blue-winged teal) were produced. A total of 83 local birds were banded, 74 gadwall, 8 black and 1 mallard, in connection with the study. Of all bird banded in connection with this study over the last three years, only 4 recoveries have been received, not enough for any analysis. This study was conducted by Assistant Refuge Manager George Peyton, with assistance from Messers. Florschutz and Williamson. Mr. Burkett Neeley and the group of Manager Trainees from Mattamuskeet also gave some much needed assistance. The results of the study was reported to the regional office as Wildlife Management Study No. 1, Project: Pea Island I, 69-70.

Banding quotas for the 1969-70 season assigned to this station was 200 Canada Geese, post season and any local gadwall or black, possible. Gadwall and blacks were banded in connection with nesting study.

Banding accomplishments were :

Post Season	
Canada Geese	177
Preseason	
Gadwall	74
Black duck	8
Mallard	1
Total	260

VI. PUBLIC RELATIONS

A. Recreational Uses

Many forms of recreation are available on the refuge; surf fishing along the beach; fishing in Pamlico Sound; camping at Oregon Inlet camp ground; swimming in the Atlantic Ocean; beachcombing; walks along the dike of North Pond for birdwatching or wildlife photography is available to those brave enough to fight the greenhead flies and mosquitos.

Period of heaviest use is from June through November. Some 1,183 visitors signed our visitor log at refuge headquarters. These visitors represented a total of 37 states, the District of Columbia, three Canadian Provinces and England, one exchange student from Bristol.

Total public use for the refuge in 1970 was 707,394.

B. Refuge Visitors

The visitors listed below are a few of those that signed our visitor log at refuge headquarters.

John Fields, Pungo Refuge	Flymouth, N. C.
Conley Moffet, Regional office	Atlanta, Georgia
John Davis, Mattamuskeet Refuge	New Holland, N. C.
Otto Florschutz, Jr., East Coast Biologist	Washington, N. C.
Paul Tipton, NPS	Manteo, N. C.
Duane Bernard, NPS	Manteo, N. C.
W. O. Stieglitz, Regional Office	Atlanta, Georgia
John Cook, NPS	Sante Fe, N. M.
Preston Fiddle, NPS	Manteo, N. C.
Phillip J. Adler, Sierre Club, Car. Chap.	Greenville, N. C.
Dave Olson, NPS	Manteo, N. C.
Gerald Perry, N. C. Comm. Fisheries	Kitty Hawk, N. C.
Richard A Tubb, BSEFW	Columbus, Ohio
A. S. Hazzard, BSEFW	Gadosia, N. Y.
John Minnick, USGMA	Charlottesville, N. C.
Al Holtemeier, USGMA	Washington, N. C.
Leon Rhodes, Blackwater Refuge	Cambridge, MD.
Vince Mrazek, NPS	Manteo, N. C.
Warren Lupton, USGMA	Washington, N. C.
Harry Stiles, Central Office	Washington, D. C.
D. T. Williams, N. C. Wildlife	Okracoke, N. C.
Dr. Alexander Wetmore, Smithsonian Inst.	Washington, D. C.
Burkett Neeley, Mattamuskeet Refuge	New Holland, N. C.
Albert M. Day, Former Director, BSEFW, Ret.	Camp Hill, Pa.
Paul W. Sykes, BSEFW	Delray Beach, Fla.
Mr. John Marstrelli, Patuxent	Laurel, Md.
Mrs. Mary Marstrelli, Patuxent	Laurel, Md.
Jess Grove, BSEFW	Washington, D. C.
Jerry L. Holloman, Noxubee Refuge	Brooksville, Miss.
Eugene Czuhai, East Coast Forester	Washington, N. C.
Bob Spake, Farm agent	Manteo, N. C.
Maurice Kelly, BSEFW	Anke Bay, Alaska
Eugene Hester, N. C. Coop Fisheries Unit	Raliegh, N. C.
Foster Forbs, N. C. Wildlife	Kitty Hawk, N. C.
Walter Chason, N. C. Wildlife	Manteo, N. C.

C. Refuge Participation

Refuge Personnel gave tours to numerous groups of interested groups.

Refuge Manager gave a slide talk to the Buxton Naval Station sportsman club.

Refuge Manager attended the meeting of the Presidents Water Pollution

Control Advisory Board held at the NPS Headquarters, Manteo, N. C. on November 19. The group was given a short tour and short talk on the refuge's management program.

D. Hunting

Hunting is not allowed on the refuge. Hunting on the National Park Service and other areas near the refuge has been very light with very poor success.

E. Violations

A few violators were apprehended on the refuge this year for various offenses. Cases and their disposition are as follows:

Name	Violation	Disposition	Fine
Raymond Oliver Stoutenburg	Driving off designated road: Crossing dunes	U.S. Comm.	35.00
Glen Ray Mathias, Jr.	"	U. S. Comm.	20.00
Donald Eugene Honeywell	"	U. S. Comm.	20.00
Robert Luther Daniels	Duck hunting during closed Season; Duck hunting on NWR.	U. S. Comm.	50.00
Ricky (NMR) Scarborough	"	U. S. Comm.	50.00
Waverly Neiggs Sawyer	Driving across dunes	U. S. Comm.	25.00
Andrzes Antoni Wielhorski	"	U. S. Comm.	25.00
Charles Ellis Minton	"	U. S. Comm. Pending.	

F. Safety

Monthly safety meetings were held at refuge headquarters. All regional safety material was covered at meetings. Some topics discussed were safe driving, fire fighting, tips on handling materials properly and handling cannon charges safely.

All refuge personnel attended a defensive driving course at Mattamuskeet Refuge in July.

The refuge crew made it through another year without an accident. The last lost time accident occurred on January 21, 1958. There has been some 4,727 calendar days since the last accident with a total of 68,151 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 such as boots, rain suits, gloves, safety goggles, etc., will be purchased as needed.

VII. OTHER ITEMS

A. Items of Interest

The Bureau issued a 25 year permit to the U. S. Army Corps of Engineers for the construction of a pier on the refuge at Oregon Inlet. The pier will be used for loading materials and supplies on dredges while operating in the Oregon Inlet Area.

A permit was issued to the U. S. Coast & Geodetic Survey for the temporary establishment of an electronics station at Refuge Headquarters from July through November. Equipment was used to map the ocean floor from the beach to the continental shelf.

A five year research permit, Permit # 4-70-10, was issued to Dr. W. V. Campbell, Professor at North Carolina State University, for the "Investigation of Insects Affecting Vegetation Used In Coastal Dune Stabilization".

In December a rare pigmy whale ran aground on the beach at refuge headquarters. Two fishermen found the whale and tried to get it back in the water, but all efforts failed. Not to be outdone, they with the assistance of Assistant Manager Peyton loaded the little whale on the scout and hauled it to Oregon Inlet and released it in deep water. When last seen, the whale was swimming in the direction of the open sea.

Messrs. Peyton and Williamson attended a law enforcement workshop in Washington, N. C. the week of August 23-28.

In case the reader hasn't guessed by reading this report, Mrs. McGinnis, our clerk, resigned October 1. Mrs. McGinnis' husband is with the National Park Service and was transferred to another assignment. Due to the distance from the refuge office to civilization, our efforts to find a new clerk have been unsuccessful.

B. Photographs

Photographs depicting some of the activities are on pages following signature.

C. Credits

Sections I, V, VI and Forms were prepared by Assistant Refuge Manager Payton.

Date:

1-18-1971

Submitted By:

H. F. Williamson Jr.
Refuge Manager

Approval:

Walter O. Stieglitz

Assistant Regional Supervisor

1-22-71



Pier construction at Oregon Inlet. The Bureau issued the U. S. Army Corps Of Engineers a permit to construct a pier on Pea Island for use by the Corps' dredges while working in the Oregon Inlet Area. (R-3-12-70)



One of the dolphins, in Oregon Inlet, the Corps constructed to tie up dredges during foul weather and rough seas. (R3-9-70)



The old Coast Guard Telephone Lines, a part of the senery around here for a long time, was sold and torn down this year. The wire was sold to a Telephone Company, but the poles was retained by GSA and released to the National Park Service. (R-1-6-70)



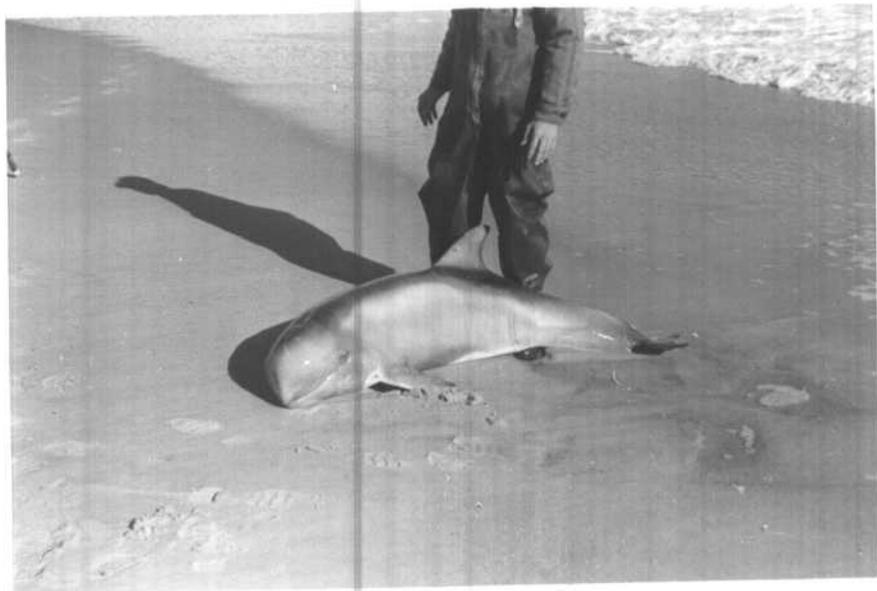
Sigh base at Refuge headquarters under construction. Base was constructed from Crab Orchard Stone. Stone blends in with the sand and vegetation real well. (R-2-5-70)



Sigh base after completion. Completed base cost the refuge approximately \$250.00. We purchased all materials and hired a stone mason to construct the bases for us. (R-2-7-70)



A little grass and a few shrubs sure improves the looks of things out here. Tifton 419 Bermuda, Pittosporum, Euonymus and Yucca were used around the comfort station to make the place look presentable to the using public. (R-2-16-70)



This little fellow, believed to be a rare pigmy sperm whale, ran aground near the refuge headquarters. It was loaded on a refuge vehicle and hauled to Oregon Inlet and released in deep water. When last seen it was swimming seaward. (R-3-20-70)



Too much liqueur and speed. Two sailors stationed at Buxton Naval Station was having a little celebration. Car rolled once from side, then end over end before coming to rest. Men were found and taken to the hospital some 8 hours after accident. Both were back on duty a week later. (R-1-18-70)



To much speed. A local man traveling late at night ran off the highway and flipped in the loose sand. He was also lucky. He complained that his ribs hurt, but he never did have to see a Doctor. (R-3-16-70)



I

New bulkhead constructed at watercontrol structure in New Field Dike, Pamlico Sound side. Old bulkhead in foreground was about washed out. (R-3-2-70)



I

Bulkhead constructed at New Field water control structure, field side. (R-3-0-70)



Water across highway is seepage from high sea tides. (R-3-18-70)



Wind tide from Pamlico Sound flood the highway at New Inlet, water is approximately 3 feet deep at deepest point. Highway was closed four time in 1970 from flooding. (R-2-2-70)



One of the drainage ditches, shallow v, in New Field. Good stands of millets, flat sedges, smart weed and spikerushes in ditches while the higher areas have grown up in waxmyrtle, groundsel tree and other undesirable species. Brush will be controlled by burning and disking. (R-3-14-70)



Dense stand of dune peas in New Field, plowed area. Good crop of peas on all higher areas this year. (R-3-3-70)



Cannon net trapping site located on the berm of North Pond Dike. This location is one of our best trapping sites. A total of 177 geese trapped on the refuge in 1970. (R-1-9-70)



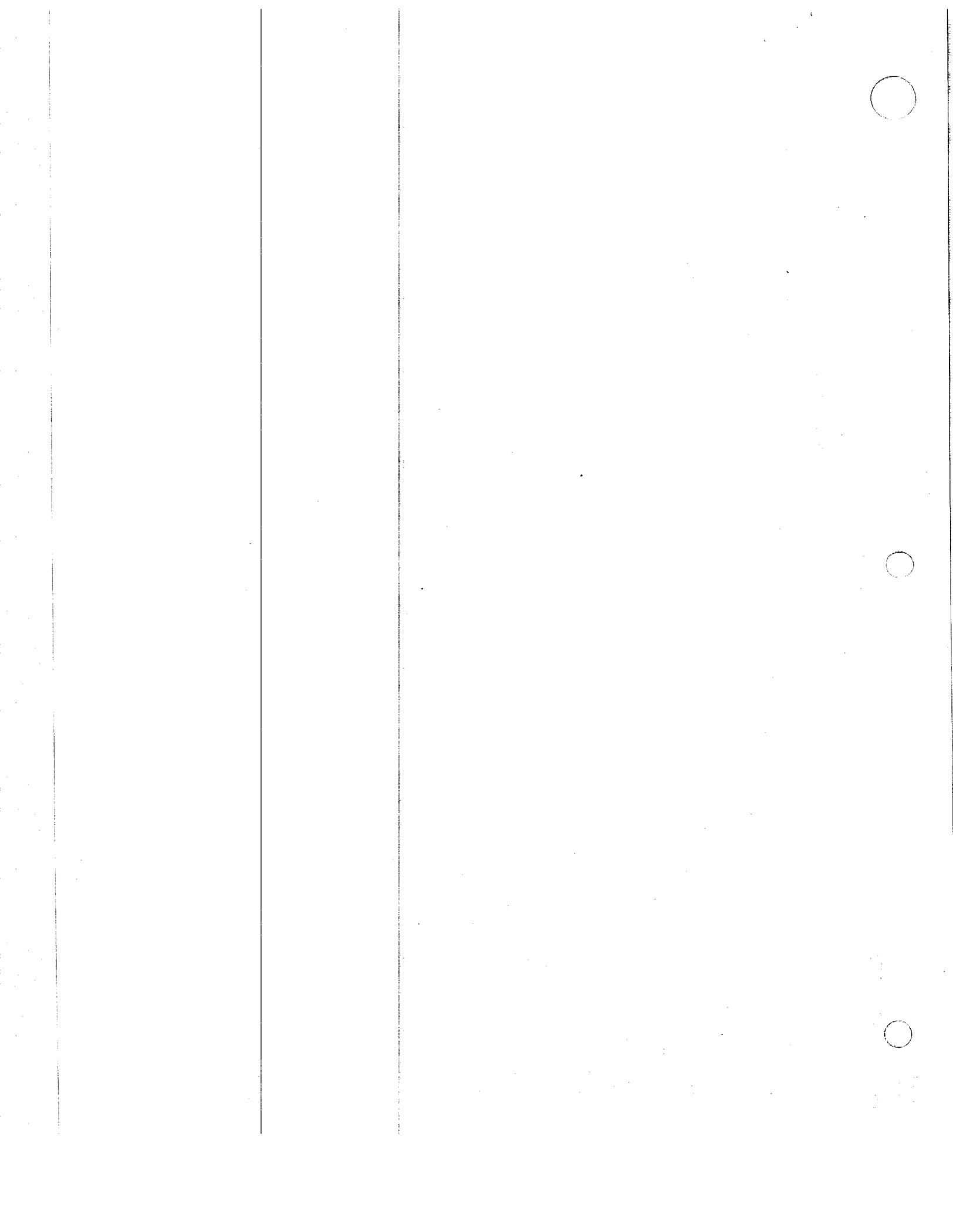
If you can find it, there is an otter in this shot. The only sighting on the refuge in 1970. Otter was in North Pond. (R-3-7-70)

WATERFOWL

REFUGE Pea Island Refuge

MONTHS OF January 1 TO April 30, 1971

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling Trumpeter	85	61	30	6	12	4	17	134	51	60
Geese:										
Canada	5,200	3,900	3,013	2,221	2,360	2,043	3,233	1,395	3,339	770
Cackling Brant										
White-fronted Snow	6,110	4,391	4,184	2,819	3,145	2,750	4,383	925	20	115
Blue	20	25	11	28	25		5	11		3
Other										
Ducks:										
Mallard	232	252	175	194	195	50	30	15	50	30
Black	3,325	2,314	2,376	3,215	3,055	1,749	845	365	311	668
Gadwall	615	187	225	175	155	35	40	15	30	229
Baldpate	106	45	168	115	225	5	5	20	10	
Pintail	5,245	671	1,290	1,130	1,575	220	75	50	35	2
Green-winged teal	1,075	500	825	1,100	380	300	85	150	2,175	195
Blue-winged teal	25									
Cinnamon teal										
Shoveler	390	150	317	246	210	115	180	100	65	117
Wood										
Redhead	600	1,075	208	25	50				4	
Ring-necked	550	375	150	50	50		10	10		22
Canvasback	500	903	419	155	600	600	79	15		
Scaup	1,110	1,075	2,100	1,025	450		20	40		
Goldeneye										
Bufflehead	117	70	50	525	200	85	25	50	5	25
Ruddy	385	215	404	175	275	310	355	130	225	14
Other Hooded Merganser		25	6							
Red-breasted Merganser										2,500
White-winged Scoter					20					
Scot Scoter					10					
Coot	2,150	525	550	300	500	300	150	145	100	95





WATERFOWL

REFUGE Pea Island

MONTHS OF September 1 TO December 31, 1950

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling Trumpeter	1	1	1	1	1	1	1	1	1	12
Geese:										
Canada	12	12	7	7	31	22	50	1,026	1,811	2,325
Cackling Brant										
White-fronted Snow								2,010	6,171	7,191
Blue								50	9	20
Other										
Ducks:										
Mallard	12	15	161	215	150	2	6	10	135	110
Black	362	282		12		115	265	1,245	761	1,910
Gadwall	115	115	1	12		21	30	8	10	155
Baldpate	235	235	750	5	151	110	212	1,000	3,911	4,150
Pintail	2,010	3,010	2,600	210	5,010	500	236	1,737	2,030	6,150
Green-winged teal	2,050	2,050	525	785	285	59	58	228	1,155	3,300
Blue-winged teal	1,050	1,050	500	231	125		10	10	5	25
Cinnamon teal										10
Shoveler								6		11
Wood										
Redhead									2	
Ring-necked Canvasback									30	
Scaup										
Goldeneye										15
Bufflehead										20
Ruddy Billed Grebe						3		1	15	20
Other										10
Red-breasted Merganser									500	
Common Merganser										
Coot				5	10	9	32	95	110	1,800



	(5) Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	3,622	136		Principal feeding areas <u>North and South Pond and Bog</u>
Geese	308,016	11,330		<u>Field</u>
Ducks	625,278	12,775		Principal nesting areas <u>Not applicable</u>
Coots	29,596	2,150		
				Reported by <u>D. L. Williamson, Jr.</u> <small>D. L. Williamson, Jr., Refuge Manager</small>

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
 (Continuation Sheet)

REFUGE San Isabel National Refuge

MONTHS OF May 1 TO August 31, 1970

(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	1	1	1	1	1	1	1	123		
Trumpeter											
Geese:											
Canada	12	12	12	12	12	12	12	12	1,532		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	9	9	9	9	9	9	9	9	977	1	3
Black	260	260	260	260	260	350	500	650	13,135	25	110
Gadwall	160	510	515	515	515	650	700	800	16,195	82	383
Baldpate											
Pintail											
Green-winged teal							25	50	625		
Blue-winged teal	10	10	10	10	100	125	300	900	12,519	1	4
Cinnamon teal											
Shoveler											
Wood											
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

(Over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	<u>123</u>	<u>1</u>	<u> </u>	Principal feeding areas <u>North and South Ponds.</u>
Geese	<u>1,502</u>	<u>25</u>	<u> </u>	
Ducks	<u>94,021</u>	<u>2,109</u>	<u>500</u>	Principal nesting areas <u>Islands, ridges, and dikes in and</u>
Coots	<u>100</u>	<u>12</u>	<u> </u>	<u>around North and South Ponds</u>
				Reported by <u>N. F. Williamson, Jr.</u>
				<u>E. P. Williamson, Jr., Refuge Manager</u>

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

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

WATERFOWL
 (Continuation Sheet)

REFUGE Pea Island

MONTHS OF September TO December, 197

(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	113	918	370	15	23	80	80	80	12,158		
Trumpeter											
Geese:											
Canada	3,500	3,604	3,281	3,907	3,123	2,121	2,036	3,025	204,185		
Cackling											
Brant											
White-fronted											
Snow	8,500	10,560	7,893	8,265	4,427	5,559	7,305	7,920	527,010		
Blue	20	20	20	35	25	30	35	35	2,023		
Other											
Ducks:											
Mallard	150	50	287	350	50	55	60	55	9,315		
Black	2,200	1,650	1,021	1,006	1,127	758	965	2,500	112,899		
Gadwall	110	10	25	100	75	50	55	100	6,591		
Baldpate	4,500	5,725	2,050	2,250	855	682	675	500	222,264		
Pintail	5,550	7,376	4,260	3,800	1,475	4,680	2,410	2,500	108,581		
Green-winged teal	2,000	1,110	7,418	5,200	4,250	3,920	3,600	3,950	287,455		
Blue-winged teal	15		10		10				26,317		
Cinnamon teal											
Shoveler	10		2	20	100	85	165	315	4,319		
Wood									110		
Redhead		30	150	150	1,125	1,075	1,500	4,000	48,224		
Ring-necked	75	45	55	55	462	800	800	600	19,254		
Canvasback		11	150	150	722	1,485	2,000	1,125	37,251		
Scaup	200	150	420	500	235	1,050	1,050	1,200	31,375		
Goldeneye											
Bufflehead	500	417	676	405	222	300	325	125	20,615		
Ruddy	100	106	50	50		200	205	200	6,411		
Other Hooded Merganser				7	6	6			203		
Red-breasted Merganser			10						3,577		
Common Merganser									35		
Coot.	2,200	3,405	4,127	4,500	3,300	2,400	2,450	2,500	183,811		

(Over)

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans	<u>12,158</u>	<u>918</u>	<u>0</u>	Principal feeding areas <u>Entire refuge: North and south</u>
Geese	<u>733,218</u>	<u>14,184</u>	<u>0</u>	<u>ponds, new field, tidal creeks and marsh.</u>
Ducks	<u>1,244,886</u>	<u>17,170</u>	<u>0</u>	Principal nesting areas <u>N/A</u>
Coots	<u>183,811</u>	<u>4,500</u>	<u>0</u>	

Reported by H. F. Williamson, Jr.
H. F. Williamson, Jr.

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
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Pass Island W. Refuge Months of January 1 to April 30 1970

(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	
<u>I. Water and Marsh Birds:</u>										
Pied-billed Grebe	77	1/9	77	1/1-2/15	10	4/28				4,282
Double-crested Cormorant	50	3/10	100	3/20-4/10	15	4/28				2,900
Glossy Ibis	4	3/26	15	4/15-4/30	15	4/28				305
American Bittern	1	2/20	2	3/26-4/30	2	4/28				103
Great Blue Heron	1	1/15	5	3/20-4/30	5	4/28				238
Common Egret	2	3/13	15	4/15-4/30	15	4/28				291
Snowy Egret	4	1/7	50	4/1-4/30	50	4/28				1,856
Louisiana Heron	2	2/13	30	4/1-4/30	30	4/28				992
Little Blue Heron	1	3/26	5	4/1-4/30	5	4/28				160
Green Heron	1	4/2	2	4/10-4/30	2	4/24				50
Cattle Egret	2	4/29	only	Sighting						2
Black-crowned Night Heron	24	1/10	30	4/1-4/30	30	4/28				3,060
<u>II. Shorebirds, Gulls, and Terns:</u>										
Great Black-backed Gull	100	1/10	210	3/15-4/30	210	4/28				17,060
Herring Gull	55	1/10	575	3/15-4/30	575	4/28				30,520
Laughing Gull	100	4/10	400	4/15-4/30	400	4/30				6,500
Ring-billed Gull	170	1/10	500	3/15-4/30	500	4/30				35,580
Bonaparte's Gull	40	4/10	200	4/15-4/30	200	4/30				3,200
Black-necked Stilt	5	4/15	25	4/15-4/30	5	4/28				500
Common Snipe	40	1/10	40	1/10-2/29	5	4/10				2,565
Dowlin	75	2/20	75	2/20-4/30	75	4/28				5,175
Sanderling	200	2/20	200	2/20-4/30	200	4/28				13,800
American Oyster Catcher	4	4/10	4	4/10-4/30	4	4/28				80

(over)

	(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>						
Mourning dove	4	4/1	4	4/1-4/30	4	4/30
White-winged dove						120
IV. <u>Predaceous Birds:</u>						
Golden eagle						
Duck hawk						
Horned owl						
Magpie						
Raven						
Crow	5	3/16	50	4/1-4/30	50	4/30
Marsh Hawk	5	1/10	5	2/1-2/15	1	4/30
Cooper's Hawk	1	1/15	1	2/10-2/25	1	2/25
Sparrow Hawk	4	1/3	4	1/3-2/15	2	4/27
Osprey	1	4/10	1	4/10-4/30	1	4/24
Barn Owl	1	1/22	2	2/1-4/30	1	4/24
						1,575
						304
						46
						232
						0
						240

Reported by *N. F. Williamson, Jr.*

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 Coliiformes)
 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 Pea Island Months of May 1 to August 31 19 70

(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. Water and Marsh Birds:										
Pied-billed Grebe	10	5/8	25	7/3 - 8/28	25	8/28				2,160
Glossy Ibis	30	5/15	150	7/1 - 8/23	150	8/23	1	30	90	11,130
American Bittern	1	5/8	Only sighting							8
Great Blue Heron	5	5/8	10	6/5 - 8/23	10	8/23				1,075
Common Egret	15	5/8	26	6/5 - 7/22	10	8/28	1	5	15	2,255
Snowy Egret	50	5/8	50	5/1 - 5/22	10	8/28	1	7	28	2,470
Louisiana Heron	30	5/8	66	7/1 - 8/23	66	8/23	1	13	39	4,092
Little Blue Heron	10	5/8	150	7/20 - 8/28	150	8/28	1	8	32	7,110
Green Heron	2	5/8	5	7/1 - 8/28	5	8/28				170
Cattle Egret	5	5/15	60	7/1 - 8/23	60	8/28	1	5	20	3,250
Black-crowned Night Heron	30	5/8	100	7/1 - 8/23	100	8/28	1	15	45	8,030
II. Shorebirds, Gulls, and Terns:										
Great Black-backed Gull	200	5/8	200	5/1 - 6/30	20	8/28				13,140
Herring Gull	500	5/8	500	5/1 - 6/30	25	8/28				32,950
Laughing Gull	400	5/8	Entire Period							49,200
Ring-billed Gull	400	5/8	400	5/1 - 5/31	20	8/3				14,210
Bonapart's Gull	200	5/8	Entire Period							24,600
Royal Tern	15	6/1	30	7/1 - 8/28	30	8/28	1	6	12	2,400
Common Tern	13	6/1	30	7/1 - 8/28	30	8/28	1	6	15	2,400
Avocet	25	6/1	25	6/1 - 8/28	25	8/28				2,300
Black-necked Stilt	5	5/8	50	6/1 - 7/31	20	8/28		8	28	3,825
Sanderling	200	5/8	200	Entire Period						24,600
Willet	100	5/8	350	6/1 - 8/28	350	8/28		100	300	35,300
American Oystercatcher	20	5/31	30	7/1 - 8/28	30	8/28		5	10	2,400
Black Skimmer	10	6/1	150	7/1 ^{OVER} 8/28	150	8/28		20	80	4,700

	(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>						
Mourning dove	10	5/1	10	Entire Period		1,230
White-winged dove						
IV. <u>Predaceous Birds:</u>						
Golden eagle						
Duck hawk						
Horned owl						
Magpie						
Raven						
Fish	60	5/8	60	Entire Period		7,380
Crow	1	5/8	1	5/1-5/31	1	31
Marsh Hawk	2	5/8	2	5/8-6/30	2	122
Sparrow Hawk	1	5/9	1	Entire Period		123
Cowbird	2	5/11	2	Entire Period		216

Reported by *H. F. Williamson*

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 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.

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

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Poa Island

Months of September 1

to December 31

19 70

(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>										
Pied-billed Grebe	50	9/16/70	100	10/1-11/27	75	12/30				9,925
Glossy Ibis	150	9/7/70	150	9/1-9/27	2	12/18				1,114
American Bittern	10	9/11/70	10	9/11-10/31	2	12/31				1,220
Great Blue Heron	10	9/2/70	10	9/1-9/30	2	12/31				484
Common Egret	20	9/16/70	20	9/1-9/30	2	12/30				784
Louisiana Heron	15	9/11/70	15	9/1-9/30	3	12/30				726
Little Blue Heron	75	9/16/70	75	9/1-9/15	5	12/24				1,660
Cattle Egret	75	9/16/70	75	9/1-10/14	2	11/10				1,102
Snowy Egret	10	9/11/70	50	9/1-10/31	1	12/31				3,050
Black-crowned Night Heron	75	9/11/70	75	9/1-10/31	35	12/28				6,710
Common Gallinule	5	9/25/70	20	10/1-11/20	20	11/20				1,045
Clapper Rail	1	9/16/70	25	10/1-12/31	1	12/30				2,480
Virginia Rail	1	10/1/70	15	10/1-12/31	1	12/30				1,486
Sora Rail	1	10/1/70	5	10/1-12/31	1	12/1				485
Black Rail	3	10/13/70		only sighting						183
<u>II. Shorebirds, Gulls, and Terns:</u>										
Great Black-backed Gull	100	9/16/70	1,000	11/14-12/19	100	12/31				44,600
Herring Gull	130	9/16/70	5,000	11/14-12/17	1,000	12/31				200,620
Laughing Gull	200	9/16/70	200	9/1-12/1	50	12/31				19,900
Ring-billed Gull	200	9/16/70	3,000	11/14-12/19	1,000	12/31				205,800
Ring-billed Gull Bonaparte's Gull	50	9/16/70	3,000	11/14-12/19	1,000	12/31				122,700
Common Tern	110	9/16/70	110	9/1-10/1	10	11/25				3,970
Caspian Tern	12	9/16/70	12	9/1-9/21	2	9/30				270
Forrester's Tern	10	10/15/70	25	9/16-11/15	15	12/30				2,200
Black Skimmer	600	9/16/70	600	9/1-11/1	50	12/30				54,200
Sanderling	1,448	9/16/70	1,448	9/1-10/20	100	12/24				75,800
Avocet	10	9/16/70	35	9/1-10/31	11	12/30				3,355
Black-bellied Plover	75	9/16/70	75	9/1-10/20	10	11/1				3,870
Semipalmated Plover	200	9/16/70	200	9/1-10/20	10	11/1				10,120

	(1)	(2)	(3)	(4)	(5)	(6)	
III. <u>Doves and Pigeons:</u>							
Mourning dove	10	9/14	10	9/1-12/31	7	12/30	1,220
White-winged dove							
IV. <u>Predaceous Birds:</u>							
Golden eagle							
Duck hawk	1	11/11	2	11/10-11/12	1	11/17	14
Horned owl							
Marsh Short-eared owl	1	9/15	5	1/1-12/31	1	12/30	610
Marsh Pileon hawk	1	12/30	only sighting				7
Fish Crow	50	9/4	50	9/1-10/15	5	12/15	2,635
Marsh hawk	1	9/21	16	11/1-12/31	16	12/30	1,055
Sharp-shinned hawk	1	10/5	4	12/1-21/11	4	12/30	185
Cooper's hawk	1	12/30	only sighting				7
Red-tailed hawk	1	12/30	only sighting				7
Rough-legged hawk	1	9/29	2	9/15-11/30	1	11/25	154
Sparrow hawk	4	9/29	8	10/15-12/31	8	12/30	650
Barn owl	1	10/1	2	9/1-12/31	1	10/1	244

Reported by

D. F. Williamson Jr.
D. F. Williamson Jr.

INSTRUCTIONS (See Sec. 7532, Wildlife Refuge Report 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 Scoliformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
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- (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.

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 FISH AND WILDLIFE SERVICE
 BUREAU OF SPORT FISHERIES AND WILDLIFE
 WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Pea Island For 12-month period ending August 31, 1970

Reported by H. F. Williamson, Jr. Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type Acreage		(3) Use-days	(4) Breeding Population	(5) Production
Unit 1	Crops	<u>00</u>	Ducks	<u>101,108</u>	
South Boundary to New Inlet	Upland	<u>339</u>	Geese	<u>112,863</u>	
	Marsh	<u>1,216</u>	Swans	<u>679</u>	
	Water	<u>7,970</u>	Coots		
	Total	<u>9,525</u>	Total	<u>214,650</u>	
Unit # 2	Crops	<u>0</u>	Ducks	<u>75,159</u>	
New Inlet to North Dike of North Pond (Sound side)	Upland	<u>220</u>	Geese	<u>135,982</u>	
	Marsh	<u>664</u>	Swans	<u>275</u>	
	Water	<u>9,550</u>	Coots	<u>77</u>	
	Total	<u>10,434</u>	Total	<u>211,493</u>	
Unit # 3	Crops	<u>100</u>	Ducks	<u>1,072,905</u>	<u>417</u>
Pools 1 & 2 and New Field	Upland	<u>236</u>	Geese	<u>648,200</u>	
	Marsh	<u>415</u>	Swans	<u>22,829</u>	
	Water	<u>580</u>	Coots	<u>114,485</u>	
	Total	<u>1,331</u>	Total	<u>1,888,419</u>	<u>417</u>
Unit # 4	Crops	<u>0</u>	Ducks	<u>124,964</u>	<u>83</u>
North Dike of North Pond to Oregon Inlet	Upland	<u>320</u>	Geese	<u>162,176</u>	
	Marsh	<u>1,530</u>	Swans	<u>875</u>	
	Water	<u>8,440</u>	Coots	<u>11,165</u>	
	Total	<u>10,290</u>	Total	<u>299,180</u>	<u>83</u>
Totals for Refuge	Crops	<u>100</u>	Ducks	<u>1,374,136</u>	<u>500</u>
	Upland	<u>1,115</u>	Geese	<u>1,089,221</u>	
	Marsh	<u>3,825</u>	Swans	<u>24,658</u>	
	Water	<u>26,540</u>	Coots	<u>155,727</u>	
	Total	<u>31,580</u>	Total	<u>2,643,742</u>	<u>500</u>
	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 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.

U.S. Department of the Interior

RECEIVED

FEB 25 1964

MAIL ROOM

Regional Office, Atlanta, Ga.
Bureau of Sport Fisheries & Wildlife

UPLA GAME BIRDS

Refuge Sea Island Wildlife Refuge

Months of January 1 to April 30, 1970

(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 observed	Estimated Total	Percentage	Hunting	For Res. stocking	For Research		Estimated number using Refuge
Ring-necked Pheasant	Dikes, wax myrtle thickets, uplands and marshes (3,830 acres)	21.3				1-1	0	0	0	175	Pertinent information not specifically requested. List introductions here.



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 NR-2)
 (April 1946)

UPLAND GAME BIRDS

Refuge Roa Island

Months of September 1 to December 31, 1970

(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, wax myrtle and bayberry thickets, upland grassland and marsh (3,830 acres)	10	0	0	60% male 40% fe- male	0	0	0	375	Several birds killed on state highway



3-1753

Form R-3

(June 1945)

BI(AME

Refuge Pea IslandCalendar Year 1970

(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 refuge													

Remarks:

Reported by

N. F. Williamson, Jr.

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) **REMCVALS:** Indicate total number in each category removed during the year.

- (5) **LCSSSES:** 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 RATIC:** Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1754
Form N. 4
(June 1945)

SMALL MAMMALS

Refuge Pea Island N. Refuge

Year ending April 30, 1970

(1) Species Common Name	(2) Density Cover Types & Total Acreage of Habitat Acres Per Animal		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion	
			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				
Muskrat	Impoundments and adjacent marsh areas (1,500 acres)		2	N	O	N	N							786
Otter	Entire Refuge and associated tidal creeks (5,880 acres)		392	N	O	N	N							15
Nutria	Impoundments and adjacent marsh areas (1,500 acres)		42.9	N	O	N	N							35
Mink	Entire Refuge (5,880) acres		588	N	O	N	N							10

* List removals by Predator Animal Hunter

REMARKS:

Reported by W. F. Williamson, Jr., Refuge Manager

INSTRUCTIONS

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

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

DISEASE

Refuge Red Island

Year 1970

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

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 **1110** (5-7) Report Yr. | Mo. | Calendar year **1970** Period (8-11)

ACTIVITY	Code	VISITS FOR THE MONTH	
		Total Number	Total Hours
Hunting: Big Game	01		
Upland Game	02		
Waterfowl	03		
Other Migratory	04		
Other	05		
Bow	06		
Fishing: Salt Water	07	101,873	393,832
Warm Water	08		
Cold Water	09		
Environmental Education	10		
Wildlife Photography	11	191	1,271
Wildlife Observation	12	68,116	18,732
Conducted Programs	13		
Field Trials	14		
Wildlife Trails	15	9,671	11,465
Wildlife Tours/Routes	16		
Visitor Contact Stations	17	1,183	480
Camping (wildlife related)	18	13,340	160,016
Picnicking (wildlife related)	19	1,657	2,825
Wildlife Interpretive Center	20	80	20
On-Site Programs	21	25	34

ACTIVITY	Code	VISITS FOR THE MONTH	
		Total Number	Total Hours
On-Site Programs	22		
*Miscellaneous Wildlife	23	22,790	15,053
Swimming	24	9,652	28,156
Boating	25		
Water Skiing	26		
Camping	27	3,520	12,210
Group Camping	28		
Picnicking	29	2691	5,232
Horseback Riding	30		
Bicycling	31	40	14
Winter Sports	32		
Fruit, Nut and Vegetable Collecting	33		
*Miscellaneous Non-Wildlife	34	472,260	126,132
Peak Load Day	35	9,000	
Actual Visits	36	707,394	
Fee Area Use	37		
Number of Fee Areas	38	(14-18)	
Fee Collections	39	\$	
Collection Costs	40	\$	

*Use reverse side to indicate types of activities summarized under miscellaneous codes 23 and 34. MAKE NO OTHER ENTRIES ON FACE OF THIS FORM.

23. General bench combing.

34. People just driving through the refuge to get to points beyond.

3-1757
 Form NR-7
 (Rev. June 1960)

Pea Island

(1) 70

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge _____ Year 19 ____

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., Bus., etc.)	(2) C or R	Date	Method Purchase 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
Pittosporum			4/1		84.00	0					4/3		
Buonymus	6		4/1	"	15.00	0	"				4/3	"	
Bermuda Tifton 419	180 Sq. Yds.		4/16		720.00	0	Comfort Station and Residence	Strip sod	900 Sq. Yds.		4/17	Good	--
Yucca	10			Trans plants taken from old			hunting club site .						

Several shrubs and yucca plants were taken by tourist.

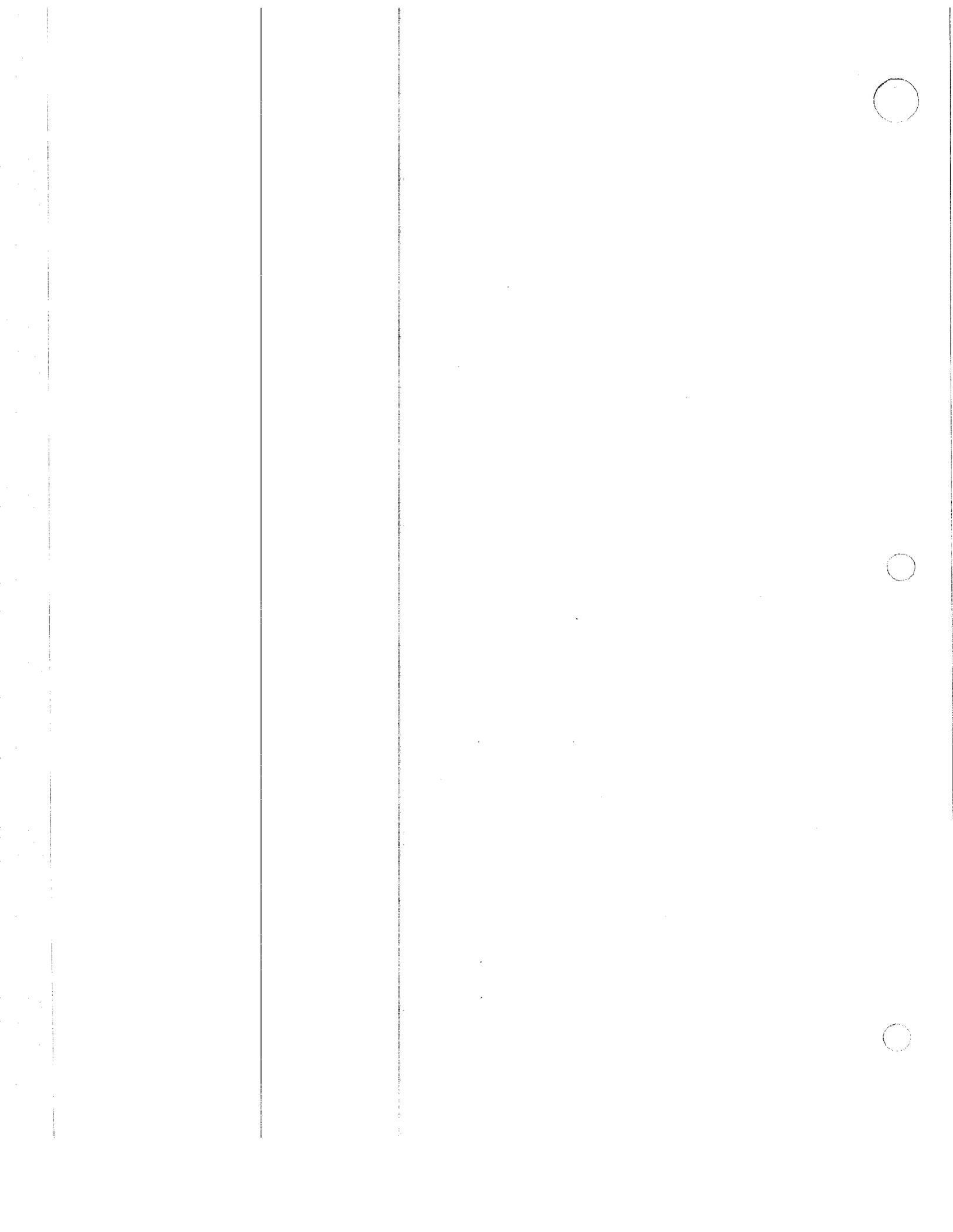
Several other shrubs died due to drought condition. Remaining

Remarks: yucca plants survived and are growing well

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

Total acreage planted:

Marsh and aquatic _____
 Hedgerows, cover patches _____
 Food strips, food patches _____
 Forest plantings _____



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
	Acres	Bu./Tons	Harvested		Unharvested				
			Acres	Bu./Tons	Acres	Bu./Tons			
Common Ryegrass					95	143 tons	95	Winter browse for Geese	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 Island

Months of January through December, 1956

(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	195 bu	370 bu	0	0	195 bu.	195 bu.	175 bu.	0	175	0
Common Ryegrass	0	5000 #	5000 #		5000 #		5000 #	0			

(8) Indicate shipping or collection points 20 bushels corn from Back Bay Refuge and 175 bushels of corn from Pungo Refuge. Ryegrass seed purchased in Elizabeth City, N. C.

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

(10) Remarks Corn used for bait in trapping program.

*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 San Isidro Year 1950

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

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

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

Cords.....

Ties.....

.....



ANNUAL REPORT OF PESTICIDE APPLICATION

100 Island	
Proposal Number	Reporting Year
1	1979

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)
not used:								

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

