

PEA ISLAND NATIONAL WILDLIFE REFUGE
NARRATIVE REPORT
DECEMBER 1 TO SEPTEMBER 31, 1957

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PEA ISLAND NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

SEPTEMBER 1, TO DECEMBER 31, 1957

Lewis B. Turner, Refuge Manager

Houston C. Phillips Refuge Aid

I, GENERAL

A. Weather Conditions

Weather conditions generally has been fair to good during the last four Months, No Hurricanes ocured during the period and only two severe North Easterers which is to be expected any time from Oct. through March.

Rainfall has been somewhat above normal with a total of 24.50 inches during the period which is app. 6.50 inches above normal.

Temperatures has ranged below that of the same period of last year having had three cold fronts during Nov. and Dec, with a low of 22 Degrees on Dec. 13 and several readings below 26 which is somewhat unusual for this early in the Winter for this part of the Coastal area.

Listed below is the weather data by Months as furnished us by the National Park Service who maintain an Official Weather Station at Bodie Island Station only three miles North of the Refuge and reflects weather conditions as they actually exist on the Refuge.

	Precipitation		Max	Min
	This Mo.	Dep. From Nor.	Temp	Temp
Sept.	<u>7.41</u>	<u>/ 2.91</u>	<u>92</u>	<u>58</u>
Oct.	<u>4.25</u>	<u>- .25</u>	<u>77</u>	<u>38</u>
Nov.	<u>6.99</u>	<u>/ 2.49</u>	<u>71</u>	<u>39</u>
Dec.	<u>5.85</u>	<u>/ 1.35</u>	<u>68</u>	<u>22</u>
Tot.	<u>24.50</u>	<u>/ 6.50</u>	<u>92</u>	<u>22</u>

Extremes

B. Habitat Conditions

1. Water Conditions

With an abundance of Rainfall for the last four Months, Water conditions has remained very satisfactory throughout the period, this is in contrast to the preceeding period when both Impoundments was completely dry for a six week period during July and August.

Guage readings at the first of Sept. was North Pond 3.78 and South Pond 3.98, Water levels had risen to, North Pond 4.90 and the South Pond 5.06 at the end of Dec. which floods out most of the marginal edges of both ponds.

Water conditions in the Pamlico Sound has remained fair to good with no Hurricanes to roil it up, Only one high Sound tide has ocured during the period, No salinity test have been made during the four Month period but it is believed to be about normal or App. 62 % Sea strength along the western border of the Refuge.

2. Food and Cover

Food on the Pea Island Refuge area is considered to be the most important factor involved in the success of the area as a wintering ground for Waterfowl, Surveys of the Sound waters during th fall disclosed it to be spotty, Some areas had an excellent stand of aquatics and others showed very little if any grasses growing, but was considered about normal for the entire area.

With no water in the two ponds for a six week period during the summer, The main body of the ponds produced almost nothing, the edges of both ponds had very good stands of Millets, Smartweed, and three squares which has furnished a good source of feed up to date but is about eaten out as of now.

The 20 acres of soybean and Milo planted during the summer proved to be a big disappointment, Some experimental plots planted previously showed some promise but evidentially the soil at Pea Island is not suited to their production since we made an almost complete failure, All the beans and Milo produced was cleaned out by about 2000 Canada Geese within one week, The 42 Acres of Ryegrass has done very well with an added application of Nitrate it has produced better than any crop planted in previous years and is now furnishing browse for from 500 to 1500 Geese almost constantly, The last six weeks has been so wet that attempts to burn off areas of Marsh set up to burn this season has been unsuccessful so far but we expect to burn app. 400 acres when conditions permit, These areas of burned Marsh furnish browse during the last two week of Feb. and all of March when we can get a close clean burn, This is when an acute shortage usually develop almost every year and food is most urgently needed, Native Beach Pea which is very much in demand by Canadas and Black Ducks produced an average crop but at best never supplies any great amount of food considering the number of Waterfowl and the amount of food required during the winter season.

Food and Cover Cont.

Salt Cordgrass Spartina Alterniflora and three Square Scirpus Am. the roots of which furnish at least 90 % of the greater Snow Goose food was in abundance over most of the lower portions of the Refuge area and there has been no shortage of food for the flock of 8.500 to 10.000 Snow Geese that has wintered on the Refuge up until Dec. 31, They clean out an enormous amount of these Species but there is large areas of virgin stands that has not been used to date.

It is not thought important to report on cover in much detail since the number of species needing any great amount of cover is limited on the Pea Island area and there is adequate cover for all those in need of it.

II WILDLIFE

A. Migratory Birds1. Populations and Behavior

The summer population of Gulls, Terns, Herons and Egrets that was present on the Refuge all during the summer Months started migrating at about the usual time which is Sept. 20 and thereafter, by Oct. 20 very few of these were still present on the area with the exceptions of Black Skimmers which is always a late migrant and waits until the first cold weather to move southward.

Great Black Backed, Herring and Ring Billed gulls started arriving at about the same time that the summer population started to decline and by Dec. 10 there was upward of 10.000 of these Gulls present on the Refuge which is an increase over last years numbers.

The first of the fall migrants of Waterfowl arrived Sept 21 when 52 Blue wing Teal was observed on the north Pond, The next in order was Piebilled Grebes which arrived about one week later in small numbers, Pintail, Black, and Widgeon Ducks began to arrive during the first week of Oct. with a scattering of Mallards, To date the Population of Ducks has never reached over 11.000 compared with app. 24.000 for the same period last year, The reason for this radical decline in population on Ducks is not known but it is known that the Refuge area is no exception to the rest of adjacent coast line which has less than 50 % of last years number of Ducks.

The first Canada Geese arrived on Oct. 11 which is three days later than last season this small flock numbered 42, and it was not until Oct 21 that large numbers of Canadas arrived, Peak Counts for the season has been about 8.300 compared to 10.500 last year or about 20 % less in numbers.

Greater Snow Geese began to arrive on Nov. 10 when app. 6.300 came in within two days and by Dec. 7 this number had increased to 10.800 compared with 9.500 same period last winter,

Populations and Behavior Cont.

These birds usually feed in tight flock formation and in some particular location, Contrary to this habit this winter the flock of Snows has been scattered over most of the Refuge area and at one time was divided into at least a dozen or more groups with about 5.500 of them feeding below New Inlet which has not happened before in the last nine years.

Swan showed the greatest decrease of any wintering species the first 12 arrived Oct. 22 and built up to 85 during the week of Nov. 24, This compares with a peak population of 340 last winter, as of Dec. 31 there was only 13 Swan on the entire Refuge.

B. Upland Game Birds

Does not apply to Pea Island with the exception of an occasional dove passing through

C. Big Game Animals

Does not apply to Pea Island Refuge area.

D. Fur Animals, Predators

Fur bearing Animals on the Refuge is mostly muskrat which is estimated to number around 3.000 or over, these Animals remain in an almost constant state never showing much increase or decrease as far as can be determined.

Otter number 30-35 according to our best estimates any they like the muskrat seem to remain at about the same number year after year, But due to their far ranging habits it is thought that some of these Animals are trapped off each year south of the Refuge where it is known considerable trapping activities are carried on during the winter season, These animals cover the entire Refuge area is search of food even to the surf line along the Ocean side and at times range as much as eight miles in a single day, This means they leave an unusual amount of sign and our estimates may be too high on Otter.

Nutria which is a new comer to the Refuge built up quite a population before we became aware of their presence in any numbers, To date 16 of these Animals has been destroyed since last June and it is thought there is not to exceed over a half dozen on the Refuge at the present time since sign has become very scarce since we started our eradication program but there is known to be at least three still at large, Two of these Animals has been trapped in our Duck traps within the last Month and was destroyed.

E. Hawks, Eagles, Etc.

Of the Hawks, the common Marsh hawk is the most common on

Hawks Eagles Etc. Cont

the Refuge estimated to number 10-14 through the winter season, This specie is an early arrival in the fall and leaves along with the last of the spring migrants, They are not considered as important predators altho they are known to catch Coots occasionally.

Duck Hawks are next in order generally numbering 4 to 6 and are known to prey on Coots, Shore Birds, and ~~xx~~ even a black duck on rare occasions, These Birds attract an unusual amount of interest from groups of Bird Watchers and others interested in wild life.

Eagles that normally winter on the Refuge hardly ever number over 3-4 these are Bald Eagles and are known to prey on Ducks to some extent but the most harmful effects from their presence is to keep the concentrations of Waterfowl in a turmoil which they seem to take pleasure in at all times, Snow Geese are especially wary of Eagles and it is not uncommon to see two eagles working as a pair have a couple of thousand Snows in the air at one time.

Pea Island has no crows during the winter Months but do have a few Fish Crows during some of the ~~xxx~~ summer Months, Never more than 30-40 at any one time.

Boat Tail Grackles are present in some number during the winter Months and camp on our Goose trapping sites just as long as grain is distributed, No special census has been made to determine peak numbers of these but a rough estimate would be not to exceed 800-1000

G. Fish

Sport fishing along the Surf line declined slightly over the same period last year, Mostly due to the weather being colder on the average for the last two Months, A fair to good run of weak Fish, (Speckled Trout) occurred during the Month of Oct and fishing pressure was extra heavy for a three week period during Oct. no run of channel Bass came through as they usually do during Oct. Some Flounder and Gray Trout was caught but fishing was off some what from a success standpoint, Periodic Checks made during the period would indicate there was app. 3.300 man days of sport fishing during the last four Months

H. Reptiles

Not enough to warrant reporting on in detail.

I. Diseases, Botulism and Other

The disease which some years effect the wintering flocks of Canada Geese on Pea Island has been very light to date this winter with only 6 known to be sick or dead, Two of these was found dead and the other four observed was so far gone they could not fly

Diseases, Botulism and Other Cont.

this number is below last years count up to Dec.31, but it is to early to make any estimates or predictions as to the season totals since the worst outbreaks usually occur during the last two weeks of Jan. and through March.

III. REFUGE DEVELOPMENT AND MAINT.A. Physical Developments

No new development project has been started or completed during the period.

1. Maintenance

Usual Maintenance schedules has been maintained throughout the period, including, some painting on the buildings and structures, repairs to the 12 miles of fence line, clearing brush from the south pond road, Boat hauled out and repainted inside and out, overhauling Duck traps and Goose trapping equipment, Scheduled maint. and tuneup on Motor Equipment, Farm machinery fire pumps Etc.

B. Plantings1. Aquatics and Marsh Plants

None accomplished for the period.

2. Cultivated Crops

Our normal fall farming operation has in past years been 52 acres of domestic Ryegrass, This was reduced to app. 45 acres this year due to trying out 20 acres of summer Soybean and Mile in the south Pond border, As mentioned under Food and Cover this item proved to be a bad investment, The 45 acres of ryegrass was planted the first week in Oct. planting techniques was different from past years, Instead of plowing and harrowing to field to prepare a seed bed the field was closely mowed three weeks in advance of planting, and 400 lbs of basic fertilizers applied, Three weeks after planting an additional 150 lbs of ammonium Nitrate was applied, seed at the rate of 130 lbs per acre was sown, This combination has produced the best browse crop to date that has ever been grown on Pea Island and will be the method used in the future conditions permitting

C. Collections and Receipts

None for the period, No Specimens Collected.

D. Control of Vegetation

During the period June 1 to July 3, 18 Acres of Cattail T Domingensis was treated with Dalapon, (Dowpon) by ground spraying operation using a Gorman-Rupp pumping unit and working at 35-40 RIE PSI, Rate of application was 21.25 acid equivalent per acre

Control of Vegetation

The growth of Cattal was fully leafed out app. 6 Ft high with green pod forming.

Within a six week period there was a total kill back of all plants and about 65 % had fallen down, On the date of last inspection there was less than 4 % comeback from old root systems, This was the treatment No. 1 with harbicides on the area and no data is available on actual kill from previous treatments.

Cost of this operation was, Material, \$21.00 per Acre, Cost of Equipment, \$1.00 per acre or a total of \$22.00 per acre not including Refuge personnel time which ran to 216 man hours.

In addition to the above four 1 acre experimental plots was treated with a combination of Dalapon and Amino Triazole in varying percentages, This operation was carried out on Aug. 2 on a virgin stand of Cattal, Ground operation with a 20 Ft. Boom mounted on a military Jeep, Specie, T Domingensis.

stage of growth on this area was fully matured with full formed pods and pollen all shed off height app. 8 Ft. 100 % density.

plot No. 1,	Dalapon,	Lbs. 21.25, Acid Per acre	
		Cost \$22.00 " "	
Plot No. 2,	Dalapon, lbs, 10, Amino Tri.	1.5 \$22.96 " "	
Plot No. 3,	Dalapon " 10, " "	3.0 \$23.42 " "	
Plot No. 4,	Dalapon " 12 " "	6.0 \$34.04 " "	

This operation was carried out on this late date to test the effectiveness of late summer spraying with Amino Triazole which is claimed to have the ability to kill at any time the plants is still fully green, The action of these combinations was very much slower than those applied earlier in the season and on the last inspection Oct. 12, did not look very promising but final results will not be known until next spring when we check the comeback if any.

E. Fires

No fires has occured on the Refuge during the period, and no planned burning has been done to date.

IV. Resources Management

The only Economic uses on the Refuge area is the Concession at the North end of the Island which now is owned by the National park Service and leased out to a private operator, this establish-ment has been closed up since labor day, Revenue aceruing to our Service through agreement with the NPS is handled at Regional Office levels and to date this office has not been furnished a copy of the accounting.

V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. Field Investigations

No actual field investigations or research has been conducted during the period as such, Weekly Waterfowl census, and Canvases on a periodic basis of the Refuge area searching for sick or dead Canada Geese has been made during the period, All of which is not considered in the field of Research, Two man days was expended in assisting Mr. Charles Eveans in Family counts on Greater Snow Geese for the purpose of determining the juvenile ratios and family behavior on the wintering grounds, Trapping and Banding Activities will be covered in detail with April Narrative report.

VI. PUBLIC RELATIONS

A. Recreational Uses

Fishing activities declined slightly along the Surf line for the period compared with last years sport fishing, this is attributed to the severe cold weather during the latter part of season and a poor run of Channel Bass.

Visitors interested in Wildlife in general, Bird watchers, Photography and published articles concerning Snow Geese and other species accounted for the next greater portion of visitors, Plain sightseeing, Beach Combing was another popular past time recreation during the first part of the period.

Check made at regular intervals for information and data would indicate that the following estimates would be somewhere near correct,

Sport Surf Fishing	3.300 Man days
All other	6.700 " "

1. One way Traffic Through the Refuge

Figures listed below is compiled from data furnished us by the National Park Service who maintain automatic counters at Oregon Inlet.

	Vehicles	Passengers
Sept.	12.646	41.732
Oct.	5.257	16.412
Nov.	3.820	11.078
Dec.	1.940	5.626
Tot.	<u>23.663</u>	<u>78.848</u>
Calander Year, 1957	Tot. 103.843	Tot 321.340
Calander Year, 1956	Tot. 93.753	Tot. 298.808

B. Refuge Visitors

OFFICIAL

	Date	
Mr. Robt. F. Gibbs, NPS, Supt.	9/3/57	Manteo, N. C.
Dr. A. L. Martin, FWS.	9/8/57	Washington, D. C.
Mr. John Steenis, FWS.	9/8/57	Laurel, Md.
Mr. Edwin W. Ball, FWS, R. O.	9/8/57	Atlanta, Ga
Director & Mrs. D. N. Janzen, FWS	9/10/57	Washington, D. C.
Mr. Victor W. Kay, FWS, R. O.	10/7/57	Atlanta, Ga.
Asst. Secretary Ross L. Leffler,	10/30/57	Washington, D. C.
Mr. Robt. Halstead, FWS. Agent,	10/30/57	Washington, N. C.
Mr. Charles D. Evans, FWS, Bio.	12/19/57	Laurel, Md.

UNOFFICIAL

No list will be submitted covering Unofficial Visitors, We had 262 Registered Visitors during the period to the Refuge area from 17 States, Canada and Holland.

C. Refuge Participation

None to report for the period.

D. Hunting

Does not apply to Pea Island.

E. Violations

A small amount of night hunting was known to occur on two occasions and although Refuge personnel expended six man days and night on patrol we were unable to catch the parties in the act, They evidently suspected we they were being watched and discontinued hunting, No other known violations has occurred.

Date Jan. 14, 1958

Approved: Lawrence L. Turner

By Herwin B. Turner
 Title Refuge Mgr.

Special Agent Supervisor
 JAN 14 1958

PUBLIC USE - C. Y. 1957

Please supply figures, or your best estimates for the following categories when applicable to your refuge:

A. Sea Island National Wildlife Refuge.

B. Estimated total use of all types 31,866 visitor-days.

1. Hunting use (for those refuges having public or regulated hunting.)

Estimate visitor-days None.

2. Fishing use.

Estimated visitor-days 11,415.

3. Miscellaneous use (lump such uses as picnicking, swimming, wildlife observation, birdwatching, as well as those on the area for business or official use, including economic uses such as farming or trapping.)

Estimated visitor-days 20,030.

C. Remarks.

Jan. 14, 1958
Date

Lewis B. Turner
Refuge Manager

WATERFOWL

REFUGE Pea Island refuge

MONTHS OF Sept. 8, TO Nov. 8, 1957

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling Trumpeter									12	27
Geese:										
Canada	1	3	4	26	105	224	358	1.418	3.162	4.800
Cackling Brant										
White-fronted Snow							38	38	38	38
Blue								3	4	4
Other										
Ducks:										
Mallard				1	8	8	2	30	27	70
Black	760	700	800	700	700	300	305	608	635	780
Gadwall	700	685	700	800	700	300	324	520	780	900
Baldpate						2.000	800	1.400	1.285	1.300
Pintail			700	1.500	3.100	3.600	802	960	1.650	1.900
Green-winged teal									500	650
Blue-winged teal			400	600	380	380	24	160		80
Cinnamon teal										
Shoveler										3
Wood										
Redhead										
Ring-necked Canvasback										8
Scaup									1.074	900
Goldeneye										
Bufflehead										2
Ruddy							560	80	650	800
Other Unidentified										
Coot:					23	59	10	200	213	375



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

REFUGE Pea Island Refuge

MONTHS OF Nov. 14, TO Dec. 26, 19 57

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimate seen: total	
	11	12	13	14	15	16	17	18			
<u>Swans:</u>											
Whistling	78	47	85	51	13	13	9		2.205	0	0
Trumpeter											
<u>Geese:</u>											
Canada	7.300	7.300	8.500	8.300	8.450	8.400	7.800		452.322	0	0
Cackling											
Brant	7								49	0	0
White-fronted											
Snow	6.800	6.500	7.250	10.500	10.200	9.000	8.400		411.600	0	0
Blue	9	9	12	14	8	4	6		511	0	0
Other											
<u>Ducks:</u>											
Mallard	134	90	108	116	90	51	24		1.686	0	0
Black	700	625	740	655	750	750	900		79.342	0	0
Gadwall	950	900	820	880	655	385	300		79.233	0	0
Baldpate	1.700	1.650	1.700	1.720	1.300	470	600		98.375	0	0
Pintail	2.100	1.800	1.300	2.060	2.200	1.200	1.100		182.514	0	0
Green-winged teal	900	930	800	1.100	900	490	300		43.390	0	0
Blue-winged teal	45	50	28	85	25	8	10		15.925	0	0
Cinnamon teal											
Shoveler	12	38	75		84	75	40		2.289	0	0
Wood											
Redhead	2	3	30		20	300	65		2.940	0	0
Ring-necked	300	400	550	1.260	970	700	250		31.066	0	0
Canvasback	2								14	0	0
Scaup	1.100	950	800	550	530	335	300		45.753	0	0
Goldeneye											
Bufflehead	2	4	2		12	12	10		308	0	0
Ruddy	300	450	480	528	500	180	40		17.080	0	0
Other/Unidentified	950	2.600	2.100	1.800	1.700	800	300		86.380	0	0
<u>Coot:</u>	550	550	680	525	480	270	400		27.790	0	0

(over)

	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans	2.205	85	None this period
Geese	874.842	18.800	" " "
Ducks	687.755	10.754	" " "
Coots	27.790	680	" " "

SUMMARY
Principal feeding areas <u>Shoal waters of the sound and the</u>
<u>two fresh water impoundments, Snow Geese use Marsh areas</u>
Principal nesting areas <u>Does not apply this period</u>

Reported by Louis B. Turner

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

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

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge Pea IslandMonths of Sept. 1. to Dec. 31. 1958

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total Estimate
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Number
I. <u>Water and Marsh Birds:</u>										
Herons, Great Blue	Res.		11	9/13	2	12/20				20
" Little Blue	Res.		81	9/13	9	12/20				115
" Black crowned	Res.		158	9/13	4	12/20				180
" Yellow Crowned	Res.		62	9/13	2	12/20				100
" Louisiana	Res.		42	9/13	5	12/20				60
Egrets, Snowy	Sum. Res.		166	9/13	2	10/22				200
" American	" "		241	9/13	6	10/22				350
Grebes Piedbilled	Res.		312	11/8	42	12/20				400
Loons, Common	4	10/16	32	12/20	9	12/20				60
Bitterns, American	3	10/16	6	12/20	4	12/20				15
Commonants	45	10/16	230	11/15	62	12/20				300
Skimmers, Black	Sum. Res.		630	9/13	22	10/22				800
Rails, Clapper	No accurate data on Rails, Est. Population									850
Gannets	200	11/15	2,800	12/13	400	12/20				5,000
II. <u>Shorebirds, Gulls and Terns:</u>										
Terns, Royal	Sum. Res.		325	9/13	6	11/8				500
" Common	" "		730	9/13	2	11/8				900
" Black	24	10/16	800	11/22	30	12/13				1,500
" Least	Sum. Res.		400	9/13	10	11/8				800
Gulls, Laughing	Res.		4,200	9/13	150	12/20				5,000
" Herring	"		7,000	12/13	3,800	12/20				8,000
" Black Backed	40	10/16	600	12/13	350	12/20				800
" Ring Billed	Res.		300	12/13	200	12/20				450
Plovers, Black Bellied	35	10/16	80	11/22	16	12/20				200
" Wilson	Sum. Res.		250	9/13	3	11/8				400
Yellow Legs, Greatless	Res.		785	9/13	46	12/20				1,300
Sand Pipers, All Species	Sum. Res.		9,300	9/13	850	12/20				11,000
Turnstones, Ruddy	" "		400	9/13	20	11/8				750
Sanderlings	" "		1,500	9/13	75	11/8				2,000

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	Does not apply to Pea Island with the exception of an occasional dove observed									
IV. <u>Predaceous Birds:</u> Golden eagle										
Duck hawk	1	9/6	5	11/3	1	12/20				6
Horned owl										
Magpie										
Raven										
Crow										

Reported by Lewis E. Turner

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

UPLAND GAME BIRDS

Refuge Pea Island Months of Sept. 1, to Dec. 31, 1957

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specificoally requested. List introductions here.
	<p>Does not apply to Pea Island Refuge with the exception of an occasional dove passing through. Never see more than two or Three at any one time</p>									

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.

(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												
Does not apply to Pea Island Refuge, No big Game present.														

Remarks:

Reported by _____

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated total number of young produced on refuge.
- (4) REMOVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.

- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

116008

Refuge Pea Island

Year 1957

Botulism

Lead Poisoning or other Disease

Period of outbreak None

Period of heaviest losses _____

Losses:

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

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

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

Areas affected (location and approximate acreage) _____

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

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease Gizzard Worms and other internal parasite

Species affected Canada Geese

Number Affected	Actual Count	Estimated
Species		
<u>Canada Geese</u>	<u>28</u>	<u>45</u>
_____	_____	_____
_____	_____	_____

Number Recovered None

Number lost 28

Source of infection Unknown

Water conditions Good

Food conditions Fair

22
Remarks 111 of the Geese listed above was lost during the last half of last winter season, To date this season only 6 Canada Geese have been counted known to be sick or dead

8

○

PUBLIC USE

Refuge Pea Island

Calendar Year 1957

Total Use Visitor-Days	Hunting Use	Fishing Use	Miscellaneous Use
10.000	None	3.300	6.700

Where practical, by means of occasional spot checks, or other methods, show by percent and visitor-days the breakdown of the above figures and other related information:

Hunting (on refuge lands):	Percent	Visitor-Days	Acres	Miscellaneous:	Percent	Visitor-Days
Waterfowl	<u>None</u>	<u> </u>	<u> </u>	Recreation *	<u>67 %</u>	<u>6.700</u>
Upland Game	<u>None</u>	<u> </u>	<u> </u>	Official	<u> </u>	<u> </u>
Big Game	<u>None</u>	<u> </u>	<u> </u>	Economic Use	<u> </u>	<u> </u>
Supervised by refuge <u> </u> by State <u> </u>		No. of blinds <u> </u>		Other Sport Fishing	<u>33 %</u>	<u>3.300</u>

Hunting (off
 refuge lands): Estimated man-days of hunting on lands
 adjacent to the refuge 560 (These figures
 should not be included in hunting-use totals above).

Fishing:

Acres of ponds or lakes None and miles of ~~islands~~ Surf Line
12 open to fishing.

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

8

9

3-1757
 Form NR-7
 (April 1946)

PLANTINGS
 (Marsh - Aquatic - Upland)

Refuge Pea Island Year 1947

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Planting	Survival	Cause of Loss	Remarks
No planting under these headings have been accomplished this period.								

TOTAL ACREAGE PLANTED:

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

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

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Foe 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			
Sorghum, Dekalbs F-62A	15				5	Est. 40 bu.		5	
Soybean	15				15	Est. 60 bu.		15	
Ryegrass, Italian					45		Winter Browse Crop	45	
All farming by Refuge Personnel									
								Fallow Ag. Land	.00

No. of Permittees: Agricultural Operations None Haying Operations None Grazing Operations None

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				65
Hay - Wild				2. Acreage Cultivated as Service Operation				65

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 Sept. 1. through Dec. 31., 1957

(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
Mixed Grain	None	30 Bu.	30 Bu.			30 Bu. Trapping		None			
Corn Yellow Shelled	None	55 Bu.	55 Bu.			35 Bu. Trapping	35 Bu.	20 Bu.		Trapping	None

(8) Indicate shipping or collection points 30 Bu. from Back Bay Refuge, (Mixed Grain) 55 Bu. Corn purchased at Belcross, N. C.

(9) Grain is stored at Pea Island Field Station

(10) Remarks _____

*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.

COLLECTIONS AND RECEIPTS OF PLANTING STOCK
 (Seeds, rootstocks, trees, shrubs)

Refuge Foa Island Year 1957

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

TIMBER REMOVAL

Refuge Pea Island Year 1945

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
	None, does	not apply to Pea Island,		No Timber on	the area.			

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

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

Regional Director, Atlanta, Ga.

~~August~~^{Sept.} 7, 1957

Refuge Manager, Pea Island Refuge, Manteo, N. C.

Narrative Report- Pea Island, May 1, to August 31, 1957

Please find submitted herewith Narrative Report covering the period mentioned above.

It is thought to include all activities and programs carried out at Pea Island worth reporting, Some of the subjects are treated somewhat briefly as they are reoccurring items and more or less repetitious from one Report to another.

Heinie B. Turner

PEA ISLAND NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY 1, TO AUGUST 31, 1967

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PEA ISLAND NATIONAL WILDLIFE REFUGE
NARRATIVE REPORT
MAY 1, TO AUGUST 31, 1957

I, GENERAL

A, Weather Conditions

Conditions was about seasonal for the summer months with the exceptions of an unusual number of clear cloudless days, Temperatures ran a little higher than last year, Rain fall was way below last summer during the same period when we had a plus of 6.08 inches above normal with minus 3.58 for this period, No severe storms or hurricanes have occurred for the last four months and as a whole weather conditions could be considered above average.

Listed below is a summary rainfall and temperatures as furnished by the National Park Service who maintain an official weather station just three miles north of the Refuge.

	Precipitation Actual	Dep. from Normal	Temperatures	
			Max.	Min.
May,	4.58	X .08	88	43
June	3.23	- 1.27	93	65
July	.37	- 4.13	99	61
Aug.	6.24 <u>79.42</u>	X 1.74 <u>- 3.58</u>	93 <u>99</u>	63 <u>61</u>

B, Water Conditions

Water Conditions in the two Impoundments for the four months period ending leaves a lot to be desired, Levels in both ponds dropped steadily during the first three months of the period and went completely dry by Aug. 18 when some 6 inches of rain occurred and brought water levels back up some what.

Conditions of the Pamlico Sound fared much better and remained in a clear stable condition throughout the period with no turbulence except that caused by normal tidal action, No salinity test was made during the summer but salinity is estimated to be about 60 ‰ sea strength.

Listed in the table below is gauge readings for both ponds each month ending.

Month	North Pond	South Pond
May	4.66	3.94
June	3.30	3.92
July 10th, went dry	3.30	3.20
Aug.	3.78	3.98

May-Aug-1957

A, Migratory Birds1, Population and Behavior

Populations as a whole for the period has been about normal with a few exceptions, May first the Refuge still had 160 Canada Geese from the winter flocks remaining, These continued to decrease until on by June 12 only one Canada remained it is still with us.

App. 900 Black and Gadwall ducks, 30 Blue wing Teal and a dozen Red breasted Mergansers was still present at the start of the period, This is about normal for Black and Gadwall which both nest on the Refuge Area, Brood counts on black ducks indicate a hatch of 63 Broods with an average of 7 to the Brood, Gadwalls Numbered 54 Broods averaging 7 to the Brood or a total of both Species 839 young, This compares with a total of 519 last year, Most of the increase was Black Ducks, Blue wing Teal only hatched 3 broods averaging 6 to the Brood or 18 young, This compares with 7 Broods last year with 56 young, One brood of Red Breasted Mergansers hatched off with 6 young, last year 1 Brood with 7 young.

Gadwalls only used the North Pond for nesting purposes but Black ducks used both the North and South Ponds and some of the tide water creeks along the Sound side, No doubt we missed a good number of nesting blacks due to the extensive area used for nesting.

Summer migration of Gulls, Terns Herons and Egrets continued all through the first week of May until the total population of these birds numbered several thousand with laughing Gulls accounting for the largest number, A few black Skimmers was present during the first week of May but it was about three weeks later when the main flocks arrived this Species is the latest arrival in the spring.

Laughing Gulls deserted the Refuge for nesting purposes last year due to storm damage to the two Island they generally use but several hundred pair nested on the Refuge again this summer using two low lying Island located just off shore on the sound side, Estimates covering nesting Gulls is app. 1200 nest with about 1800 young, Black skimmer nested along the Atlantic side on the higher beach areas on the north end of the Island, Numbering about 180 nest.

Herons and Egrets moved their nesting sites a short distance from the area used last year, Being in the south pond along the west side, also nesting birds decreased from last years total of 257 to app 140 all species combined the reason for the decrease is unknown, Most of the birds nesting in these rookeries this season was Black Crowned Night Herons and Snowy Egrets with a scattering of other species.

Flovers, Yellow Legs, Sandpipers Turnstones and sanderlings has been present throughout the period in about the same numbers as usual for this period, Willetts showed a very good increase over last years number, having counted app. 560 along the beach line during the second week of July, Also about a dozen oyster catchers was present on the Refuge during the summer, This is unusual since we do not generally have but one or two,

7 Avocets have been in the south Pond for some two weeks this is not a record but is not common since they are usually here during the Month of Oct-Nov. numbering from 4 to 12, 9 Hudsonian Curlews was observed on Aug. 19 in the south pond area but have not been seen since.

May-August 1957

2, Food and cover

Due to severe drought conditions that existed during most of the summer Months with corresponding low water levels in both Impoundments, Food production has been below normal in both of the ponds, With both ponds going completely dry very little vegetative matter exist in the main body of either pond, The marginal edges has a fair to normal crop of Smartweeds and three Squares but the bumper crop of Wild Millet that we had last year did not repeat this summer, Native Beach Pea which is an important item of food during the late winter months has been effected by the drought conditions with very good stands on the lower margins and none on the dune types to mention.

Surveys made during the first week of June and another in Aug. of the waters of Pamlico Sound from Oregon Inlet south to Rodanthe indicate we have a normal or better stand of Aquatics in the Sound area, This border extends for app. three miles off shore and accounts for over 90 % of the food available for the wintering flocks of Waterfowl during the winter, If no hurricanes occur food conditions should be very good during the coming winter season in the sound area.

For the period ending there is very few Waterfowl present and of course there was abundant food supply for all present.

3, Botulism and other Diseases

None occurred on the Refuge during the period.

4, Fur Bearing Animals

Populations of Fur Bearers which consist of Muskrat, Otter and Nutria shows no change in numbers except Nutria which is a new comer to Pea Island, Muskrats is estimated to number some 2500 or more and have all been concentrated to a small area bordering the Borrow Pits due to the two ponds going dry most all summer, This condition has occurred before and has has no adverse effects on the Rat population as far as can be determined, they just scatter out again when water conditions become normal, This condition only effect the Rats within the Impoundments, Those along the tide water creeks on the Sound side has had normal conditions during the period.

Otter which number app. 40 if our estimates are any where correct has shown no change since the last reporting period.

Nutria, Which as mentioned before was thought to number not over a half dozen since only scanty sign was observed and the Animals hardly ever seen at all, During April we received instructions to eradicate these if possible from the Refuge, They like the muskrats all moved into a narrow border along the borrow pits where the only water remained in the ponds, Apples and Sweet Potatoes were used to bait them out into open places on the flats and 13 Adult and 1 Immature Nutria has been killed by shotgun to date and the program is still in progress but it is thought that the major part of the population has been destroyed, We will no doubt have to continue this program for some time since it is known that the outer banks south of the Refuge is heavily infested with Nutria, Arrangements has been made with local officials of the NPS to extend our operations into their area if we find it necessary to keep these Animal down to a minimum.

A, Physical Development

No new Development projects have been undertaken or completed this period.

B, Refuge Maintenance

As in the past this particular activity has accounted for most of the time and effort of the Station personnel during the period, To keep a Refuge at peak efficiency it has been found necessary to pay close attention to Maintenance schedules, Small items has a way of developing into major jobs if not caught in time and corrected.

During the period, one new Septic tank was installed to replace an old metal tank that rusted out serving the publicity office, All basement walls was painted two coats of Bondex, Tractor and farming equipment, Trucks, Pumps, Compressors, Boats and other equipment has been maintained on a regular schedule, 17 man days was expended on the 12 miles of fence line to keep it in condition, Boundary line markers and shields was checked and new ones installed where necessary and post straightened up or reset along the Sound side, 11 Miles of fire control lines was double cut with fire line plow, 22 Acres of Cattail was sprayed by ground operation with Dalapon and Aminó Triazole, and 20 Acres of Soybean and Milo was planted, This last item will be more fully covered in detail under farming.

C, Farming

The 20 Acres of Beans and Milo mentioned above was planted out during the first week of May on the upper marginal edge of the 80 acres plowed last year for brush control in the south pond area, The land was again double out with Bush and Bog Plow, Harrowed fertilized and planted, due to a 6 Inch rain immediately after planting the beans suffered with too much water and part of the stand died out on the lower portion of the field, That portion that survived now has a fair to good crop of beans maturing, The milo faired better, It will stand more moisture than Beans, DeKalbs No. F-60-A hybrid was planted which matures rather late, It now has a fair crop of head maturing, This was mostly an experimental planting and is still too early to determine final results.

D, Fires, Wild and other

No wild fires has occurred on the Refuge area during the period and no controlled burning has been done.

IV, ECONOMIC USES

A, Commercial

The only commercial use of the Refuge is the concession that is now owned by the NPS and leased out to a private operator, Any and all revenue derived from this source is handled at Regional office levels and this office has not been advised of amounts collected.

Economic Uses Cont.

B, Non-Commercial

No free use permits has been issued during the period and none is in effect at the present time

V, FIELD INVESTIGATION AND APPLIED RESEARCH

A, Field Investigation

Brood counts was made at weekly intervals during the nesting season on Black and Gadwall Ducks, Periodic checks was conducted on Heron Rookeries and Gull nesting Island during the summer, Two surveys were made of the Pamlico Sound from Oregon Inlet south to Rodanthe to determine conditions of Aquatics along the three mile border used for feeding purposes by Waterfowl during winter Months, Considerable night prowling was done in connection with the Nutria eradication program for the purpose of getting information on habits and activities of the Animals and general locations as to numbers.

B, Research

No actual Research work was accomplished during the period.

VI, PUBLIC RELATIONS

A, Recreational Uses

Visitors to the Refuge area seeking recreation increased app. 15 % over the same period last year, Uninterrupted Ferry service and good weather conditions brought thousands of people to the Beaches, As usual fishing was the main attraction and fishing success was fair to good, With Blue Fish, Speckled Trout and flounder accounting for the major numbers caught.

Bathing, Beach Combing, Photography and just lazing around was a popular past time with several parties interested in Wildlife and Bird watching, 134 persons was given conducted tours of the Refuge during the four month period, 96 of these was 4-H club member students who received merit awards for outstanding conservation work in field project in the various N. C. Counties,

Estimates based on weekly checks of Beach and other uses on the Refuge show a total of App 18,500 man days use of the Refuge for Recreational purposes during the reporting period, Camping on the Camp Ground maintained by the NPS on the north end of the Island has not had normal usage due to another camping ground just across Oregon Inlet which is now complete with Toilet Facilities, Water Lights and other items including daily spraying for Mosquito control, The Camping area on the north end of Pea Island is now in the process of construction and when completed will greatly increase the use of this area.

Public Relations Cont.

B, Publicity

Efforts concerning publicity at the Station during the summer consist mostly of distribution of Refuge leaflets and bird list to all Tourist Resorts, Hotel and Cafes from Powell's Point south to Hatteras who in turn hand them out to the visiting public, Our field publicity office has been kept open on a round the week basis including Saturdays and Sundays when most of the visitors is present, Furnishing information to the general public concerning the Refuge and it's purposes and Maint. as a Waterfowl Area.

Due to limited time available for public Relations work by Refuge persennel no public appearances at scheduled meeting have been made or any Movies shown.

Records for the four Month period show we had 732 registered Visitors to the Refuge, This compares with 633 for the same period last year and 144 from Jan 1 through April this Year.

Listed below is a summary of one way Traffic through the Refuge as furnished by the NPS, who maintain automatic counters at Oregon Inlet.

Month	Vehicles	Passengers
May,	8.195	24.650
June,	11.981	42.848
July,	27.992	99.602
August,	23.526	81.778
	<u>Tot 71.694</u>	<u>Tot 248.878</u>
Same Period last Year	64.524	212.868

C, Violations

No serious violations has ocured on the Refuge during the period, Ann occasional dog sometimes get out of parked automobiles at the Ferry landing, And a few people still presist in dumping trash along the highway which is also a violation of State law, No legal cases has been made this summer.

D, Visitors Schedule

Official		
Mr. John Foster	5/3	Philidelphia, Pa.
Mr. W. G. Cahoon	5/10	Mattamuskeet, Ref.
Mr. John Steenis	7/16	Laurel, Md.
Mr. James Whelan	7/16	Laurel, Md.
Mr. Edwin Ball	7/17	Atlanta, Ga.
Mr. William Hammett	8/1	Raleigh, N. C.
Mr. Jack Dermid	8/1	Raleigh, N. C.
Mr. Jacob.M Valentine	8/1	Chincoteague Ref.
Mr. Robert L. McCoy	8/1	Chincoteague Ref.
Mr. Kenneth Wilson	8/3	Greenville, N. C.

Unofficial

No attempt will be made to list unofficial visitors, We had a total of 732 registered visitors during the period and this number does not include the 96 4-H Clubmembers and attendants took on conducted tours Aug. 1 over the Refuge.

Submitted By Heerin B. Jenner

Approved BY Carl V. Ferrarich
Act. Regional Refuge Supervisor

Date July 7, 1957

Date SEP 10 1957

3 -1750a

Cont. NR-1

(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Poa IslandMONTHS OF May 1, TO Aug. 31, 19 57

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production : Broods: Estimat : seen : total		
	11	12	13	14	15	16	17	18				
<u>Swans:</u>												
Whistling Trumpeter												
<u>Geese:</u>												
Canada	1	1	1	1	1	1	1	1	3.311	0	0	
Cackling Brant White-fronted Snow Blue Other												
<u>Ducks:</u>												
Mallard												
Black	750	700	700	680	700	800	750	800	74.130	63	461	
Gadwall	600	600	575	600	600	550	600	600	58.835	54	378	
Baldpate Pintail Green-winged teal Blue-winged teal Cinnamon teal Shoveler Wood Redhead Ring-necked Canvasback Scaup Goldeneye Bufflehead Ruddy Other												
	28	35	12	20	20	50	78	80	4.501	3	18	
<u>Coot:</u>												

(over)

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans				Principal feeding areas <u>North and South Ponds</u>
Geese	<u>3.311</u>	<u>160</u>	<u>0</u>	
Ducks	<u>137.466</u>	<u>1.480</u>	<u>857</u>	Principal nesting areas <u>North Pond with a scattering in the</u>
Coots				<u>South Pond</u>
				Reported by <u>Lewis B. Turner</u>

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

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

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge Pea IslandMonths of May 1, to Aug. 31, 1957

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total Estimate
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Number
I. <u>Water and Marsh Birds:</u>										
Hérons, Little Blue	Res.		74	6/21			1	15	45	280
" Louisiana	Res.		90	6/21			1	20	65	200
" Yellow Crowned	Res.		70	6/21				None		
" Black Crowned	Res.		210	6/21			1	40	120	300
" Great Blue	Res.		10	6/21						
Egrets, American			360	6/21						
" Snowy			400	6/21			1	60	180	500
Rails, Clapper	Res. No data available									
Felicans Brown	8	5/12	28	6/14						
Grebes, Piedbilled	Res.		42	8/23				4	12	65
Bitterns American					2	5/4				
Osprey			5	6/21						
II. <u>Shorebirds, Gulls and Terns:</u>										
Gulls, Laughing	Res.		2800	6/21			2	1200	1800	4000
" Herring	Res.		1100	6/21						
" Ring Bill	Res.		265	6/21						
Terns, Common			1000	6/21			2	150	350	1500
" Royal			300	6/21						
" Least			900	6/21			1 ?	80	250	900
" Black	30	8/2	300	8/23						600
Plovers, Black Bellied	8	6/21	85	8/23						150
" Wilson			200	6/21						550
Yellow Legs, Greater & Less, Res			600	6/21						900
Black Skimmers			300	6/21						700
Sandpipers, All Species			10.000	6/21						12.000
Turnstones, Ruddy			750	6/21						1200

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	An occasional few migrating thru through, Never over a half dozen seen				
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	2 Observed on may 7th none seen since Residence in small numbers, app. 30 nesting on the Refuge area				
					Reported by <u>Lewis E. Turner</u>

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

UNITED STATES
DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Pea Island For 12-month period ending August 31, 1957

Reported by Louis H. Turner Title Refuge Mgr.

(1) Area or Unit Designation	(2) Habitat Type	Acres	(3) Use-days	(4) Breeding Population	(5) Production
Area No. 1 Two Fields	Crops	62	Ducks 20.956		
	Upland		Geese 134.866		
	Marsh		Swans		
	Water		Coots		
	Total		Total 155.222		
Area No. 2 All Dune Type	Crops		Ducks		
	Upland	2.652	Geese 132.580		
	Marsh		Swans		
	Water		Coots		
	Total		Total 132.580		
Area No. 3 All low lying Marsh and Salt Flats	Crops		Ducks 653.187	623	857
	Upland		Geese 530.713		
	Marsh	6.181	Swans		
	Water		Coots		
	Total		Total 1,183.900		
Area No. 4	Crops		Ducks 1,555.188		
	Upland		Geese 532.038		
	Marsh		Swans 24.766		
	Water		Coots		
	Total		Total 2,111.992		
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		

"Remarks" All data for the first seven months covered in this report is based on estimates. Since no segregated data was maintained for that period due to no advise on the report prior to that time

(over)

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 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.

INSTRUCTIONS

- (1) **Area or Unit:** A geographical unit that, 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. Estimated acreage of each unit should be indicated.
- (2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland consists of 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 the water category includes all other water areas inundated most or all of the growing season and extends from the deeper edge of the marsh zone to strictly open-water areas, 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 each type should be kept as accurate as possible through reference to available maps supplemented by periodic field observations and should agree with unit acreage.
- (3) **Use-days:** Use-days is computed by multiplying weekly water-fowl population figures by seven.
- (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.

Interior Duplicating Section, Washington, D. C.
1956

Refuge Pea Island Months of May 1. to Aug. 31., 1957

(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.
	Does not apply to Pea Island Refuge except for an occasional Dove passing through Mostly in Sept. and April.									

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

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

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

REFUGE GRAIN REPORT

Refuge Pos Island

Months of May 1, through Aug. 31, 1951

(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
None	0	0	0	0	0	0	0				
No Grain of any kind was carried over from last season											

(8) Indicate shipping or collection points _____

(9) Grain is stored at _____

(10) Remarks _____

*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.

Regional Director, Atlanta, Ga.

May 9, 1957

Refuge Manager, Pea Island Refuge, Manteo, N. C.

Narrative Report-Pea Island, Jan.1 through April 30, 1957

Please find transmitted herewith Narrative Report covering the period, Jan. 1 Through April 30, 1957, It is thought to cover all operations and activities carried out on Pea Island Refuge worth reporting.

In checking back over Narrative reports submitted over the years I find them very repetitious even on details, It occurs to me that at least one of these reports could be eliminated annually in the interest of saving time and paper work to good advantage to the Government, I wonder if it's just me or do the other project leaders have similar ideas along this line.

Herrie B. Turner

PEA ISLAND NATIONAL WILDLIFE REFUGE
NARRATIVE REPORT
JANUARY 1, TO APRIL 30, 1957

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PEA ISLAND NATIONAL WILDLIFE REFUGE
NARRATIVE REPORT
JANUARY 1, TO APRIL 30, 1957

I, GENERAL

A, Weather Conditions

About average seasonal weather has prevailed throughout most of this period, January was some what cold but no extreme low temperatures occurred the lowest reading being plus 20, Feb was cold and rainy with temperatures reading between 30 and 60 most of the time with only 7 days that there was no rain during the Month, March was better with readings of 35 to 70 prevailing and below average rain fall, April turned off very nice weather with slightly above average temperatures of 34 to 86 with very little rain.

No severe North Easters occurred such as was experienced during the Month of April last year when we had the Grand Daddy of them all in several years, Weather data listed in the table below was furnished through courtesy of the National Park Service Head Quarters Station at Bodie Island who maintain an official weather Station.

	Precipitation		Temperatures	
	Actual	Dep.From Nor.	Max.	Min.
Jan.	2.77	- 1.73	68	20
Feb.	5.27	x .77	67	31
Mar.	3.35	- 1.15	70	35
April	.76	- 3.74	86	34
Tot.	<u>12.15</u>	Tot. <u>- 5.85</u>	Max <u>86</u>	Min <u>20</u>

January - April 1957

Page 2,

II, WILDLIFE

A, Migratory Birds

1, Population and Behavior

Total populations at the beginning of this period was almost exactly the same as last year but was more spotty as to Species, Also a radical decrease occurred within three weeks after the hunting season closed which brought the total number of Geese and Ducks present down much earlier than was the case last year.

Canada Geese numbered app. 10,000, Greater Snow Geese was down to 650, Ducks all species combined numbered some 14,500 and as was stated above during the last two weeks of January and the first two weeks of Feb. this number decreased rapidly and by the end of Feb we only had 3,800 Geese, and about 4,500 ducks, There was no mass migration but a constant scattering out to other localities and feeding grounds.

Somewhat later after spring migration was under way the number of ducks increased again until they numbered about 6,500, No increase was noted in Geese during this period but to the contrary they continued to show a constant decrease.

By the end of March Geese numbered 1,500 and Ducks 1,600 at the end of April there was still 160 Canadas left on the Refuge Area and app. 900 Black and Gadwall ducks, Both of these Species nest on Pea Island and we expect no further decrease in this number on ducks.

As was the case last year a late northward movement of Red breasted Mergansers occurred during the last week of March and the first week of April bringing in about 20,000 which used from Oregon Inlet southward for a week or two then was gone with the exceptions of a few hundred which remained about three weeks.

Gannets which usually appear in great numbers along with the Mergansers was about two weeks early this period, Arriving about the 8th of March when there was around 30,000 feeding along the surf line bordering the Refuge, These birds feed northward in great flocks and follow the run of fish, If it moves so do the Gannets, Some times this is rapidly and other times very slowly, this year they were in the Pea Island locality only about 11 days.

Populations of Gulls, including Black Backed, Herring and Ring Bills was slightly higher than for last year, With herrings showing the increase, Black Backed and Ring Bills remained at about the same number, Total of these three Species combined was estimated to be between 9 and 10,000, Black Backed remained at about 500 or slightly over, These Gulls started the spring Migration the second week of March and was in constant movement for about 15 days when the greater number of them had departed, All of these except the Black Backed are listed as Residence Species at Pea Island since some herring and Ring Bills remain over the year around, Laughing Gulls which is a summer Resident on the Refuge began to arrive along with the departure of the wintering Gulls and at the end of April numbered around 2,500

Population and Behavior Cont.

Laughing Gulls normally nest on the Refuge but two of the off Shore Island they commonly use for nesting purposes, have in recent years been severely damaged by storm tides and last year they moved to some higher spoil bank Island along the east side of the Channel north of Oregon Inlet which is off the Refuge area, A survey of their former nesting Island recently indicate they will again move off the Refuge for nesting purposes this summer.

Royal and Common Terns arrived in about the usual numbers along with Laughing Gulls also a few Caspians, These at the end of April numbered app.800

Black Skimmers which is a late migrating Specie has not shown up to the end of the period.

Willetts, Yellow Legs, Flowers and Sandpipers, Started arriving in good numbers during the third week of March and continued to increase all through April and we have at the end of the period an estimated number of some 6.000 all Species combined.

The only unusual Specie observed during the last four Months was 3 Cattle Egrets which was seen on April 23rd. in the North Pond area they only stayed one day and have not been seen since.

2, Water Conditions

Altho we have had a minus 5.85 inches of Rainfall for the period water conditions has remained very good especially during the first two months of the period when we needed it most, Both ponds have remained at normal or slightly above for this time of the year ranging from 4.66 to 5.05 for one and 4.00 to 4.68 for the other on the gauges, this allows maximum use of the greater part of both impoundments.

Weather having been better than normal as for North Eastern Waters in Pamlice Sound have have continued in very satisfactory condition throughout the four Months ending, Salinity of the Sound waters is not known but thought to be about 55-60 ‰ Sea strength which is about normal for the time of the year, Listed below are Gauge readings for both ponds for all four months ending April 30.

Date	North Pond	South Pond
Jan. 31,	4.96	4.66
Feb. 28,	4.92	4.68
Mar. 31,	5.05	4.62
April,30	4.66	4.00
	Max.Dev. <u>.39</u>	Max. Dev. <u>.68</u>

3, Food and Cover

The first six weeks of the reporting period food supply was adequate but a critical shortage occurred after this date, Both ponds was completely exhausted of all vegetative matter in the main body of the ponds and the marginal edges which produced such an excellent crop of Smartweed, Millet and three Square was eaten out clean, This is thought to be one of the reasons for the abrupt departure of nearly all the population of ducks within a very few days, Surveys were made of the Shoals existing out to three miles in Pamlico Sound during the first week in Feb. and they were also found to be clean of Vegetative matter or nearly so.

A better than average crop of Native Beach Pea matured during the fall Months and this was also cleaned out during the last two weeks of Feb. and all of March, Leaving very little in the way of food for the late stayer on the Refuge area.

It has been noted over the years that flocks of Ducks of all species are prone to leave an area in a hurry if the food supply becomes scarce, While on the other hand Canada Geese when they once get established on the Wintering grounds for the season will only leave it as a last resort when the food is completely non-existent, It is indeed unfortunate that Pea Island does not have an adequate dependable food potential to carry all the waterfowl that would winter here if it was available, Altho every effort has been put into a farming program plus a controlled Marsh burning project for the last several years it seems that we just cannot produce enough to complete out a balanced food supply for a period of time covering the Waterfowl season and a shortage almost always exist during the last six weeks especially for the population of Canada Geese.

This season was no exception and it is thought that the only thing that saved us a bad situation was the very mild weather during the latter part of Feb. and all of March with an early Green up in April.

4, Botulism & Lead Poisoning

None occurred on the Refuge during the period

5, Other Diseases

It is believed that the disease that effect the wintering Canada Geese at Pea Island was about the same Status as last winter Known sick and dead birds for this winter numbered 27, Last years count was 46, Last year the Research Division had two full time men working on the Goose disease study which means there was more canvases made and no doubt more effected geese found, It is pretty certain that there was no more this season than last altho only Refuge personnel made the periodic canvases of the Island in an effort to locate all the effected birds.

B. Upland Game Birds

Does not apply to Pea Island except for an occasional Dove passing through.

C. Big Game Animals

Does not apply to Pea Island Refuge.

D. Fur Bearing Animals

About the usual population of fur bearers consisting of Muskrats, Otter, and Nutria show no radical change in Status since the last report was submitted, Muskrats is estimated to number app. 2,000, Otter 35-40 While Nutria is a new comer to the Refuge area, We are certain that there is at least three of these Animals present on the Refuge, Instructions has been received for the eradication of all Nutria before they can build up to a point of being a nuisance, We expect to start a trapping program on these within the next few weeks.

E. Predators

No predation occurs on the Refuge of any note, the only species of Animal predator is a few gone wild house cats which suffered some disease epidemic about a year ago and very few have been observed since.

We have an average of about three bald Eagles and two to five duck hawks wintering on the Refuge usually, These have been observed preying on coots occasionally but damage from this source is very slight.

III. REFUGE DEVELOPMENT AND MAINT.**A. Physical Developments**

The only physical development project, consisting of a new Equipment Shed, 12 X 36 Ft being built by Refuge personnel has now been completed, Materials used in construction was \$631.96 while 31 man days was expended on the project.

B. Maintenance

It has been found over the years that Refuge Maintenance is a never ending operation, This period has been no exception, There is certain schedules to be maintained if the program as a whole progresses with any degree of efficiency.

All equipment Maintenance schedules have been maintained including Safety checks and tuneups on all vehicles, Tractor, Light Plants, Pumps and farming machinery, Minor repairs to one Septic Tank, Boat hauled out and given a going over

Maintenance Cont.

7 man days on the 12 mile fence line, Clearing off drift and bushes and making repairs where necessary, All trapping Nets and Mortars hauled in cleaned oiled and stored, The 5 Portable duck traps put in repair and stored, Some paint work on the trim of buildings, Loose gutters rehung and the publicity office given an inside cleaning and touched up with paint where necessary, Major Property inventory accomplished, including numerous other item.

C, Farming

No farming have been undertaken or accomplished during the period.

D, Fires, Wild and controlled

No wildfires occurred on the Refuge area, Controlled marsh burning will be covered in detail under Controlled burning program, A separate Sheet.

IV, Economic Uses

A, Commercial

The concession formely owned by J. B. Tillett located on the north end of Pea Island has been closed up all winter and is not open up to April 30, This establishment was taken over by the National Park Service and is leased out to a privated operator, Funds accrue to our service from this transaction but are handled at Regional office levels and this office has not been furnished a copy to date.

B, Noncommercial

Under permit No. 55-906 Issued to the N. C. Wildlife Resources Commission to live trap Muskrat on Pea Island for restocking Purposes on State owned Lands, 9 Live Muskrats were trapped and removed, All females ~~Remain~~, These are listed on Form NR-4, This Report.

V, FIELD INVESTIGATION AND APPLIED RESEARCH

A, Trapping and Banding Program

This report covers a continuation of a trapping and banding program started last Oct. Partial results of which was reported in Dec. Narrative.

Up until this year trapping operations on Canada Geese was in connection with the Canada Goose Disease study being carried on by the Research Division at Patuxent, This year under instructions from the Regional office we were concentrating on Ducks to assist the Atlantic Flyway Water fowl Council in meeting their established goals, The following listed below covers the results for the season on Species and numbers Banded.

Species	Number Banded
Canada Geese,	225
Gallard Ducks,	89
Black Ducks,	82
Red head Ducks,	148
Greater Scaup Ducks,	46
Pintail Ducks,	36
Canvas Back Ducks,	3
Ring Neck Ducks,	4
Bald Pate Duck,	1
Gadwall Duck,	1
Coots,	366
Total	<u>1.001</u>

VI, PUBLIC RELATIONS

A. Publicity

Publicity for the period has been mainly local, Consisting of distribution of Wildlife Leaflets No.6, Bird lists of the Refuge, And furnishing information on all phases of the Refuge, It's Management and objectives to all interested parties, Conducting tours over the Refuge area for 4 Groups numbering from 4 to 12, No public appearances have been made or Movies shown during the period, Some 3 man days was expended in assisting Mr. Lansdale Anderson in securing final Movie shots to complete the Wildlife angle of the Movie His firm has contracted to make for the National Park Service covering the Recreational Area on the Otter Banks.

Registered visitors to the Refuge during the period numbered 144, This compares with 107 for the same period last year, And a decrease from 209 during the period reported in Dec. Narrative

B. Recreational Uses

Recreational uses of the Refuge is generally at a low ebb during the winter Months due to the weather element which prevents Fishing which is the major activity during the fall and Spring, Thus Jan-Feb we had very few visitors, Mostly those interested in Wildlife, Bird watching, Photography and allied interests, March and April things began to look up and an ever increasing number of visitors occurred

Recreational Uses Cont.

During the Month of March, Surf fishing was very poor, April was somewhat better with a small run of blue fish coming through during the last two weeks of the Month.

Based on periodic checks made during April and Visitor registration, Recreational Uses of the Refuge area increased app. 12 % over the same period last year, Figures listed below is thought to reflect the minimum man days of Recreational Uses.

Man Days, Fishing and clamming,	1.115
Man Days, All other,	2.050

Figures listed above compares with the following submitted on Recreational Uses for the four Months preceeding, Ending Dec.31, 1956

Man Days Fishing,	3.600
Man Days, All other,	6.300

Figures listed in the table below was computed from information furnished us by the National Park Service who maintain automatic counters at Oregon Inlet, One way traffic across Oregon Inlet.

VEHICLES

Month	Vehicles	Passengers
Jan.	2.359	7.000
Feb.	2.339	7.719
March,	2.501	7.403
April,	5.316	17.011
Tot.	12.515	39.133
Dec. Report Figures	9.821	32.344

C, Violations

No serious Violations occurred on the Refuge area during the period, We are still plagued with some dumping which we have been unable to break up so far, An occasional dog gets out of Visitors vehicles at times, Parties responsible for this is generally warned to keep their dogs confined when observed, No cases have been filed for action during the period.

D, VisitorsOfficial

Mr. John Nash, NPS Eng.	2/7	Richmond, Va
Mr. Allyn F. Hanks, NPS, Supt	2/7	Manteo, N. C.
Mr. Lansdale Anderson, Photo. for Out door Film Corp.	3/4-5-6	Palm Beach Fla.
Mr. Brantly Brown, Ditto.	3/4-5-6	" " "
Mr. Edwin Ball, FWS	3/11	Atlanta, Ga.
Mr. John Steenis, FWS	4/19	Patuxent Re. Refuge
Dr. ? Martin FWS	4/19	" " "
Mr. Kenneth Wilson FWS, P-R	4/19	Currituck, N. C.
Mr. W.G. Cahoon, FWS	4/19	Mattamuskeet, Refuge

Unofficial

No list will be attempted on unofficial Visitors to the Refuge, there was 144 Registered visitors to Pea Island since the last report was submitted Dec. 31, 1956

Approved By Laurence S. Stevens Submitted By Harvie B. Turner
 Regional Refuge Supervisor
 Date**** MAY 14 1957 Date May 9, 1957

CONTROLLED BURNING PROGRAM
PEA ISLAND REFUGE
WINTER, 1956-57

Work covered by this report is a continuation of the Marsh burning program that has been in effect at Pea Island Station for the last several years and covers all the burning done during the winter rather than just the present reporting period

Unit No. 4, Located along the east side of the North Pond and consisting of App. 62 Acres was burned off on Dec. 22, 1956, with a light N. E. Wind of about 15 MPH, Dominant growth was Spartina Patens about 65 %, Secured a good burn on most of the area, Lower marginal edge would not burn due to high water levels prevailing in the pond at that time, Some scattering bunch Wax Myrtle accounted for app 10 %, The rest of vegetative matter was three Square, Scirpus Am. and other Misc. Matter.

Utilization of the burn by Canada Geese and Pintail ducks was very good, Geese ranging in numbers from 150 to 400 could be counted on this burn commonly.

Unit No. 10, Located app one mile north of the South Boundary line was burned off on Jan. 9, With an E.N.E wind, Velocity app. 25 MPH, This tract has about 208 acres, Cord Grass, Spartina Patens 70-80 %, Wax Myrtle and other low bush type 8 to 10 %, Scirpus Am. 10-15 % along the west edge, Secured a fair burn on this tract with a coverage of about 90 %, of the area, Canada Geese ~~xx~~ used this burnoff constantly from Jan 22 on until Migration, Average numbers was estimated at 4 to 500.

Unit No. 7-A located in the south end of the south pond and having app. 78 Acres was burned off on Jan 11, With a S.W. Wind of app 15 MPH. Secured a fair burn on this tract also with a coverage of 90 % or better on the total area, Dominant vegetative growth was Cord Grass Spartina Patens, App. 70 % Three Quare, Cirpus Am. 20 % other Misc. matter 10 %, Use of this tract after burning by Canada Geese and Pintail ducks started within 10 days after burning and continued up until Migration numbering from 75 to 250.

A total of only 346 acres was burned this season, Of the 5.840 acres comprising the Refuge only about 1.400 Acres can be burned, and this has to be rotated on a three year basis to get a good clean burn that will attract Waterfowl, Yearly growth of the native species is so slow that at times we have extreme high tides that clean out some of the matter and prevent a sufficient accumulation even in the three year period.

After several years of burning activities, It is still our opinion that a well planned and executed Marsh Burning operation is the most economical method of producing supplemental green browse during the late winter season when the Waterfowl is most in need of it.

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

W A T E R F O W L

REFUGE Fox Island

MONTHS OF Jan 1, TO April 30, 1957, 19

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling	208	208	200	191	168	134	141	108	117	
Trumpeter										
Geese:										
Canada	9.200	9.000	8.400	8.400	6.800	4.100	4.300	3.800	3.800	
Cackling										
Brant	3	3		3	40					
White-fronted										
Snow	630	180	64	60	60	60	1	1	1	
Blue	4	4	4	4	4	4	4	4	4	
Other										
Ducks:										
Mallard	900	800	800	600	540	485	300	180	75	
Black	1.200	1.000	1.000	700	700	700	400	400	500	
Gadwall	550	500	500	508	385	400	400	550	560	
Baldpate	1.500	900	600	470	400	450	450	700	450	
Pintail	1.900	1.400	800	450	600	440	300	200	170	
Green-winged teal	1.200	1.200	950	900	860	1.000	800	700	450	
Blue-winged teal	200	90	30	12	41	4	16	30	8	
Cinnamon teal										
Shoveler	600	750	600	480	300	350	300	400	450	
Wood										
Redhead	8.000	2.400	2.000	1.200	700	300	250	125	200	
Ring-necked	700	450	200	200	200	80	200	30	45	
Canvasback	25	35	14	8	12	4	4	4	4	
Scaup	380	300	500	600	600	680	600	200	175	
Goldeneye										
Bufflehead										
Ruddy	600	600	700	700	650	700	700	600	600	
Other Unidentified	2.800	3.800	2.400	900	1.000	900	400	225	300	
Coot:	900	900	600	600	600	400	550	400	400	

3 -1750a

Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Pea Island

MONTHS OF Jan 1, TO April 30, 1957

(1) Species	(2) Weeks of reporting period								(3) Estimated	(4) Production	
	11	12	13	14	15	16	17	18	waterfowl days use	Broods: seen	Estimated total
Swans:											
Whistling Trumpeter	42	4							10.710	0	0
Geese:											
Canada	1.200	900	700	800	400	280	200	160	435.680	0	0
Cackling Brant	2	2	29	4	2				609	0	0
White-fronted Snow	60	1	1	1	1	1	1	1	7.840	0	0
Blue Other	4	4	4	4	4	4	4		4/41	0	0
Ducks:											
Mallard	34	6	12	8	2				33.194	0	0
Black Gadwall	450	400	440	400	400	430	422	499	69.594	0	0
Baldpate	55	40	12	3	8	2			42.140	0	0
Pintail	100	65	22	7	3	2			45.213	0	0
Green-winged teal	400	100	150	20	14	100			61.802	0	0
Blue-winged teal	65	100	45	60	21	12			5.138	0	0
Cinnamon teal											
Shoveler	85	80	30	20	7	4			26.992	0	0
Wood Redhead	35	40	10	10	3				94.381	0	0
Ring-necked	12	15	4	2					14.966	0	0
Canvasback											
Scaup	1	1	8	2	1	2			28.210	0	0
Goldeneye											
Bufflehead	10	10	10	4	2	1			243	0	0
Ruddy	80	80	12	4		3			43.603	0	0
Other Unidentified	60	60	18	10	6				90.153	0	0
Coot:	40	40	60	80	80	65	65	40	40.460	0	0

(over)

	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans	10.710	208	0
Geese	444.570	9.807	0
Ducks	612.140	20.755	0
Coots	40.450	900	0

SUMMARY	
Principal feeding areas	<u>Waters of the Sound, Both ponds and 62 Acre field</u>
Principal nesting areas	<u>Does not apply this period</u>
Reported by <u>Lewis B. Turner</u>	

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

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

3-1751

Form NR-1A
(Nov. 1945)MIGRATORY BIRDS
(other than waterfowl)Refuge Pea IslandMonths of Jan. 1 to April 31, 1957 1957

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total Estimated Number
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	
I. Water and Marsh Birds:										
Egrets, American	Res 7	3/29	31	4/26						65
" Snowy	3	3/29	64	4/26						90
" Cattle	3	4/23			3	4/23				3
Herons, Little Blue	Res 11	3/29	28	4/26						40
" Great Blue	Res 3	3/29	8	4/26						12
" Louisiana	Res 6	3/29	31	4/26						60
" Black Crowned	Res 18	3/29	44	4/26						66
" Yellow Crowned	3	3/29	18	4/26						45
Loons, Common	all winter		74	1/11						200
Grebes Piedbilled	Res		121	1/11						150
Commerants	200	3/29	700	4/26						1000
Felicans, Brown	4		38	3/26						200
II. Shorebirds, Gulls and Terns:										
Terns, Royal	34	3/29	108	4/26						180
" Caspian	7	3/29	41	4/26						65
" Common	200	3/22	330	4/26						500
" Least	22	3/22	80	4/26						200
Gulls, Black Backed			460	1/25						600
" Herring	Res		7000	1/26						8000
" Ringbill	Res		640	1/26						1000
" Laughing	Res		1700	4/26						2500
Yellow Legs, Greater	Res		360	4/26						450
Yellow Legs, Lesser	Res		34	4/26						60
Willetts	14	3/22	165	4/26						300
Plovers, Wilson	30	3/22	110	4/26						250
" Black Bellied	3	3/22	14	4/26						25
Sandpipers all Combined			3800	4/26						5000

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	A few doves observed passing through at times, not enough to report on				
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	an average of four used the Refuge area during the period				
Reported by <u>Louis B. Turner</u>					

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups:
- I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 - II. Shorebirds, Gulls and Terns (Charadriiformes)
 - III. Doves and Pigeons (Columbiformes)
 - IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

Refuge Pea Island

Months of Jan 1

to April 30, 1957

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'vd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Does not apply to Pea Island Refuge, except for an occasional dove during march and April										

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 Island Year ending April 30, 1957

(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	Cattail & Scirpus Am. other three Square, App. 900 acres within the two ponds, Fresh Water	28883	0	0	0	9	0						2800
Otter	Ranges all over the Refuge area	167	0	0	0	0	0						35
* Nutria	Cattail Mostly, confined to a very small area in the South Pond,	25	0	0	0	0	0						4
* Instructions have recently been received to eradicate eradicate these animals. They will be trapped off within the next few weeks													

* List removals by Predator Animal Hunter

REMARKS:

INSTRUCTIONS

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

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

REFUGE GRAIN REPORT

Refuge Pea Island

Months of April Jan 1 through April 30, 1957

(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 Shelled Corn	190 Bu	.00	190 bu.			Trapping	190 Bu	.00			

(8) Indicate shipping or collection points Received from Black Water Refuge last November

(9) Grain is stored at _____

(10) Remarks _____

*See instructions on back.

REFUGEE 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.