PEA ISLAND NATIONAL WILDLIFE REFUGE
NARRATIVE REPORT

Sept 1, To Dec. 31, 1949

CONTENTS

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NARRATIVE REPORT

Sept 1, to December 31, 1949

I. General

A. Weather Conditions

The weather during this period was mostly mild and somewhat be low normal on Rainfall, Althe data furnished by the Meterelegical Records kept by Mrs Rosa Drinkwater shewed only 4.40" precipitation for the last three months of the period it is known that during Oct 16, and 17, Pea Island had over 3.00" of rainfall.which is far above that shewn by the records at Manteo,and both pools reflect,this,staying well above the 4 Ft. Level.

Temperatures has also been above normal, With a high of 88 in Oct. and a low of 28 in Dec.with an average ranging from 40 to 60 Degrees, being very favorable for carrying on the work program here,Including controlled burning, The only foul spell of weather coming on Oct 17, only lasted about 3 days.

It will be noted that the month of Sept. has not been included in the table below,It was not obtained during this month and was not available at this late date.

	Precipitation		Temp.	
	Actual	Depart. from Normal	Max.	Min.
Oct.	1.86	+1.89	88	46
Nov.	1.64	- .71	73	31
Dec.	1.40	-264	71	28
Total	4.40	-5.24	Extremes 88	28

II. Wildlife

A. Migratory Birds

1. Population and behavior

The annual Migration of waterfowl and shore birds was about normal this fall, Shore birds was present all during the month of Sept. and until Oct 25, in large numbers at which time there was noted, a steady decline until about Nov. 15, when there were just a few to be seen. Green wing and Blue wing Teal, and black ducks were the first to arrive of the waterfowl coming in about Oct. 8, a few canada geese was seen on Oct 18, and by Nov. 1, there was several hundred present, Also 34 blue geese arrived on Oct. 28, and remained on the refuge area until Dec 1, when only 6 could be seen, Snow Geese started arriving on Nov. 9, and by the 25th. there was several thousand using the refuge, Of the ducks Pin Tails, Blacks, and Gadwalls was the most numerous, Being about on a par with last season, Scaup was off about 50% from last year and Redhead was non-existent, None being observed on the area to date.

Swan was first noted on Oct. 22, and increased until there was 113 at the peak or an increase of about 100% over last year and at the present time there is 108 still on the Refuge.

The Snow Geese are mostly using the north half of the island from Oregon inlet down to the south pond, Flocks generally in numbers from 500 up, and it amazing what they can do to a growth of Alternifiera in a short period of time, I might state here that one of the high lights of the Snow geese were, About 3800 or 4000 of them took time out from muddling Spartina and descended upon the 40 Acres of grain we planted for Canadas and in five days ate it down to a barren field, Since then only a few have been back, Flocks of from 25 to 50.

The Red Breasted Mergansers are very conspicious by their absence this season, Having seen a very few compared to other years.

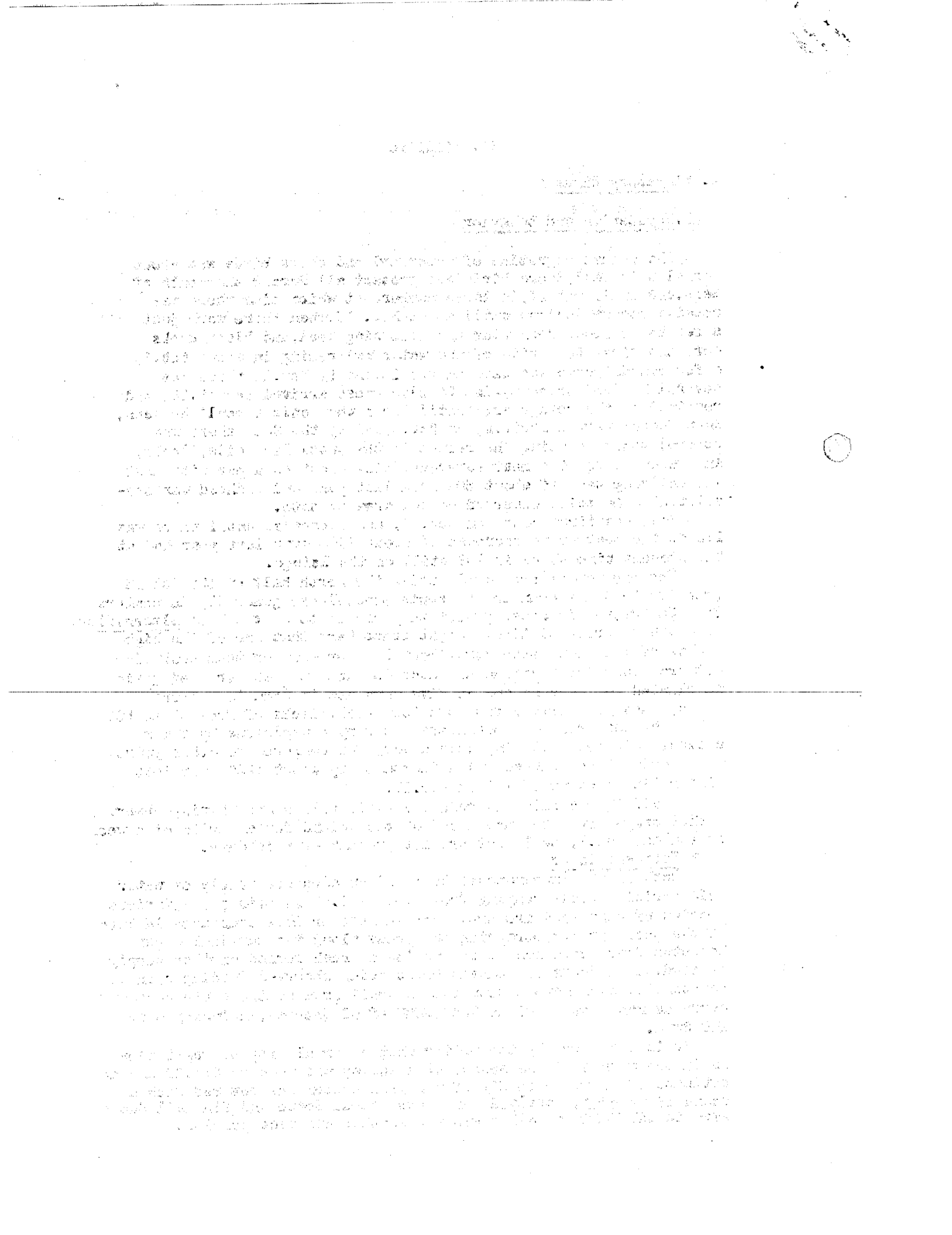
Great black backed Gulls increased by about 125% over last winter, With a count of 180 on Dec. 12.

Bald Eagles paid the refuge a visit this winter having observed 6 that stayed over the north end of the Island for a period of a week or ten day Dec. 1, to 10, but are not present at this date.

2 Food and Cover

Both of the Impoundments have had an adequate supply of water this period, Levels ranging from 4.30 to 4.90 in both pools, Various species of pond weed are prevalent in more or less abundance in both of the pools proper, Bordering the ponds along the marginal edges Rebuswus, Smart weed, and other species of rush formed another supply of feed, Black ducks and canada Geese being observed feeding upon it constantly, Never have I seen such a small area as the south pond carry as many Waterfowl ~~XXXXXXXXXXX~~ of all Species, Including over 100 Swan.

It is not known by the writer what a normal crop of vegetation is in the waters of the sound, But a survey was made on Oct. 22 and an estimate of about 25 to 30% of the Area bottom was covered with a stand of Halodule mostly, At any rate Canada Geese and Pin Tail ducks Feed in the ~~XXXX~~ at all times the weather and tide permits.



2.Feed and Cover Cont.

As Feed supplys become more and more exhausted on the Island proper it is anticipated that the sound area will be used more for a feeding ground than it is at the present time.

3. Diseases Lead Poisoning Botulism Etc.

Up to this time here at Pea Island there has been noted a total of 5 sick birds 4 Canada and 1 Snow Geese, Some of which was Collected for shipment to the Bureau of Animal Industry,None of the birds picked up showed any sign of gunshot wounds and it is assumed that it is a reoccurence of the disease that was present here last winter.

B.Upland game Birds

During the month of Oct there was Observed a few mourning doves on the Refuge with the exceptions of these NNK there was none.

C. Big Game Animals

None

D. Fur Animals,Predators,Rodents

Both pools have a good stock of Muskrats exact numbers not known but Estimated from 350 to 500,Otter are very common in the south pool, often being seen in numbers of from 3 to 8 in a pack,A live muskrat trapping program has been under way for a period of about three weeks but up to this time have not succeeded in catching any,the only known predators on the Refuge is a few gone wild common house cats which are causing very little if any damage.

E. Predaceous Birds

These birds consist of a limited number of duck hawks,Marsh hawks, and an occasional Bald Eagle,Damage from this source is of small importantance.

III Refuge Development and Maintenance

A.Physical Development

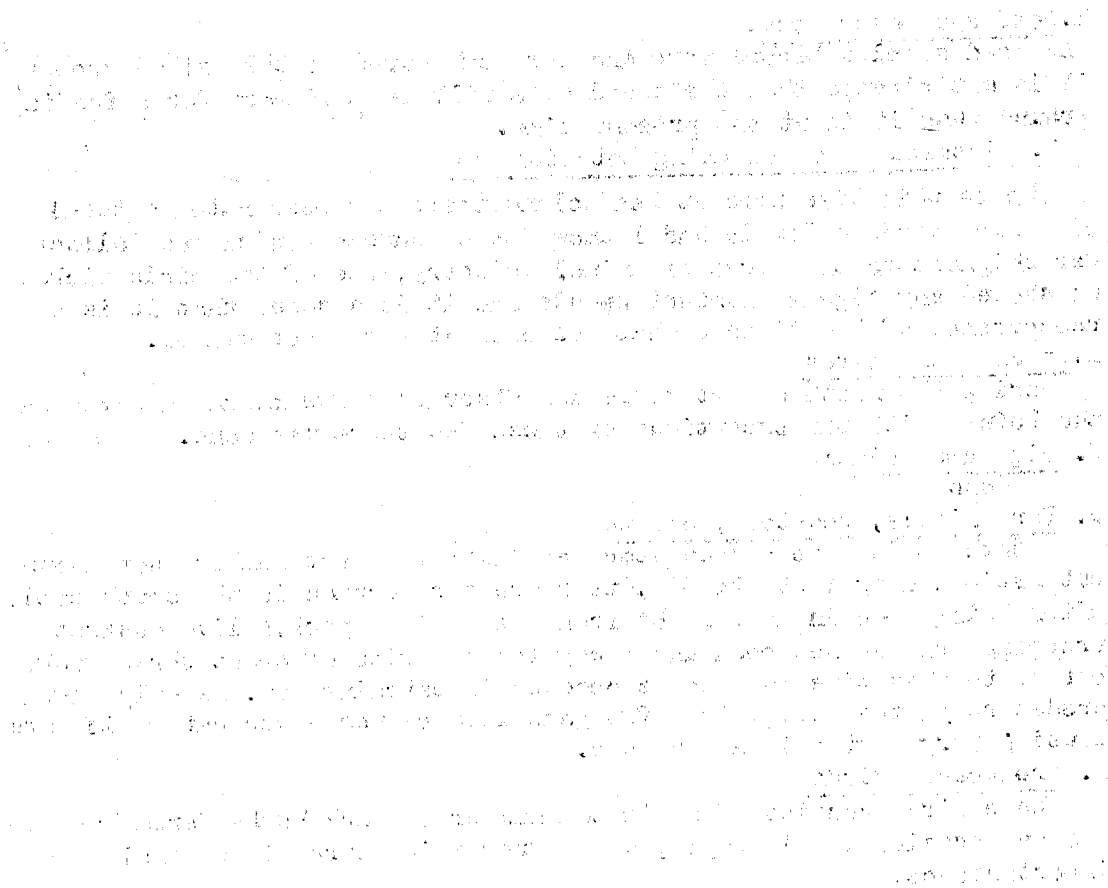
Work on the Dike around the north pool continued through this period and Breakdowns notwithstanding 464 Ft. of Dike was completed,and 150 Ft. of Burm was restored to a normal elevation,thus Completing all earth work on this project,In addition over 700 Ft.was sprriged out with Spartina Patens completing this phase of the work also,One Break through in the sand fence App. 60 Ft long by 5 Ft. deep was repaired with the bulldozier from Mattamuskett,And brush dug in upon it to hold it.

One timber runway was built over the North Dike on road rightofway, Materials being furnished by N.C. Highway Comm.

Maintenance of Equipment was quite a factor with the Dragline out in front with trucks running a close second,Operating conditions being very bad most of the Period.

B. Farming

On Oct 8, a hurry up farming program was undertaken, App. 53 Acres was harrowed up and put into cultivation,By Oct,17 App 40 Acres had been seeded out.



B. Farming Cent.

A Severe North Easter blew out on the 17th.and caused a Break through in the sand fence flooding out the south end of the farm (App. 12 acres) with sea water, Thereby stopping all farming operation in time for this season.

In view of the fact that future farming is anticipated on Pea Island it is thought that this would be a good time to summarize the net results so far,Of the 40 Acres planted about half was Wong Barley and Rye, the remainder Wheat and Oats,On the Barley and Rye we get up about a 80% stand of the Wheat and Oats a 70% stand all of which was up by Nov. 1, App. 2" high.

At which time it was noted that the tips was turning a very sickly yellow and continued to get worse as time went by until by Nov. 20, it had about killed out all of the wheat and Oats,the Barley and Rye held it own better but was in very poor condition also.

Canada Geese started using on the area in vaying flock of from 50 to up as high as 800and continued Through Nov. and Dec.In the last week of Nov. 3800 or 4000 Snow geese decended upon what was left and in five day cleaned it off down to the ground they have not been back,but up to date there is some 2 to 400 Canadas still picking around on it and it seems to be a question of,if we can raise grain and not a question of if they will take it.

It is the opinion of the writer that the poor shewing was due to a high salt content in the soil and in the atmosphere causing salt burn to such an extent the grain just could not grew.

Admitting that we get the area seeded out about three weeks late and also the fact that the fertilizer used was deficient in Nitrogen there is serious doubt in my mind that we will ever be able to successful grew any Grainxx, At least enough to make it worth the effort.

C. Collections

No seed was collected this Period.

IV.Economic Use Of the Refuge

None

V.Field Investigation Or Applied Research

None

VI. Public Relations.

A. Recreational Uses

During the first three months of the Period there was quite a number of Sport fishermen trying their luck at surf fishing along the beach side of the Island, Some very nice catches of Drum (Channel Bass) and flounder was seen being taken out, But it was not considered an average season on surf fishing,

Several Partys came in to see the Waterfowl and other Wildlife in general and most of them seem to think we have a wonderful Refuge,One young fellow ask if we had any bear on the Refuge ?

VI. Public Relations Cont.

C. Violations

With a full time Patrolman assigned to and living on the Island and a daily coverage of the entire Area Violations have been kept to zero,not having had a single one or any reported.

D. Refuge Visitors

The following listed were visitors to the Refuge this Period.

Dr. Clarence Cottam	Wash. D.C.
Dr. Warren S, Bourn	" D.C.
Mr. Richard E. Griffith	" D.C.
Mr. W. R. Dillon	" D.C.
Mr. James Silver	Atlanta, Ga.
Mr. Ancil D. Holleway	" "
Mr. Howard Miller	" "
Mr. Richard F. Dittman	" "
Mr. William P. Baldwin	Port Wenthwerth Ga.
Mr. Stuart Critcher	Williamston N.C.

Submitted By

Lewis B. Turner

Refuge Manager

WATERFOWL

Refuge Pea Island Months of Sept. 1. to Dec. 31. 1949

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Young Produced		(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
I. Swans:									
Whistling swan	6	10/22	113	11/15					113
II. Geese:									
Canada goose	21	10/18	12.500	12/6					15000
Cackling goose									
Brant									
White-fronted goose									
Snow goose	8	11/9	12.000	12/9					12.500
Blue goose	34	11/1	34	11/16					34
III. Ducks:									
Mallard	23	11/9	60	11/21					100
Black duck	Rem.		4.000	11/21					6.000
Gadwall	Rem.		325	11/1					400
Baldpate	5	10/28	14	11/8					30
Pintail	20	10/12	4.000	11/28					4.800
Green-winged teal	12	10/12	200	12/5					400
Blue-winged teal	6	10/12	150	12/1					200
Cinnamon teal									
Shoveller	12	11/9	100	12/20					200
Wood duck									
Redhead									
Ring-necked duck	10	11/9	50	12/20					100
Canvas-back	5	11/9	5	12/16					5
Scaup	22	11/1	4.500	12/20					5.000
Golden-eye									
Buffle-head	8	11/28	100	12/20					200
Ruddy duck	25	11/9	500	12/20					700
Mergansers, Red B.	6	11/10	12	12/20					50
IV. Coot:	100	10/28	350	12/5					500

Total Production:

Geese_____

Ducks_____

Coots_____

SUMMARIES

Total waterfowl usage during period 44,042

Peak waterfowl numbers 38,513

Areas used by concentrations All of the Refuge Area.

Land and water.

Principal nesting areas this season_____

Reported by_____

Lewis B. Turner Refuge Manager

INSTRUCTIONS

(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) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.

(3) Peak Concentration: 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 in the reporting period.

(5) Young Produced: 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.

(6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

2330

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Pea Island Months of Sept. 1, to Dec. 31 1949

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Cormorants	16	Seen Throughout the Season								16
Egrets, American	6		6	10/6						6
" Snowy	31		31	10/6						31
Heron Great Blue	20		30	10/6						35
" Louisanna	16		20	10/6						20
Grebe, Horned	40		40	11/28						50
" Pie-billed	25		25	11/28						35
Loon, Common	2		8	12/20						10
Avocet	6		6	11/4-12/20						6
II. Shorebirds, Gulls and Terns:										
Sanderlings			150	11/8						300
Yellow legs, Greater			50	10/20						100
Plover, Black Bellied			100	10/20						150
Sand Piper, Western			500	10/20						800
Sandpiper, Semi-palmated			450	10/20						600
Gulls, Great Black B.	6	10/28	180	12/10						200
" Bonapartes			50	12/10						100
" Herring			2000	12/20						3000
Killdeer	2	10/28	20	12/10						25
Gannets	150	11/20	400	12/15						500
Skimmers			500	10/5	8	11/16				550

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove					
White-winged dove					
IV. Predaceous Birds:					
Golden eagle					
Duck hawk	5 seen on the refuge area during this period.				
Horned owl					
Magpie					
Raven					
Crow					
Bald Eagle	6 Seen on the refuge during this period.				

Reported by.....

Lewis B. Turner Refuge Manager

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 Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Pea Island Months of Sept. to Dec. 31, 1949

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
None										

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.

Form NR-3
(June 1945)

BIG GAME

Refuge Pea Island Calendar Year Third Period, 1949

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
None														

Remarks:

Report by Lewis B. Turner

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 <u>each</u> <u>species</u> 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

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Pea Island Period ~~Week~~ ending ~~April 30~~ Dec. 31, 1949

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5) Total Population
								Share Trapping						
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	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
Muskrat	Marsh and Fresh water Ponds App 700 Acres	1½				00								Unknown

* List removals by Predator Animal Hunter

REMARKS:

Reported Lewis B. Turner

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 headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

Form NR-5 DISEASE 1616

Refuge Poe Island Year 194 Third Period, 1949

Botulism None

Period of outbreak Nov. 18, to Dec 31

Period of heaviest losses Unknown

Losses:

	Actual Count	Estimated
(a) Waterfowl	5	10
(b) Shorebirds		
(c) Other		

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

Areas affected (location and approximate acreage) 1

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

1 To 5½ Ft

Condition of vegetation and invertebrate life Good

Remarks

Lead Poisoning or other Disease

Kind of disease Unknown

Species affected Canada Geese

Number Affected Species	Actual Count	Estimated
	5	10

Number Recovered Unknown

Number lost *

Source of infection Intestinal Disorder

Water conditions Good

Food conditions Fair.

Remarks

3-1756
Form NR-6
(April 1946)

FISH

Refuge Pea Island Year 194 Third Period, 1949

Species	Relative Abundance	Sport Fishing		Commercial Fishing		Restocking		Number removed for Restocking
		Man days Fishing	Number Taken	No. of Permits	Pounds Taken	Number Stocked	Area Stocked	
No fishing on the Refuge Proper								

REMARKS:

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Pea Island Year 194 Third Period, 1949

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
Spartina Patens	N. Dike	1 Ft Sq. Sprigged	460 Running Ft Or 11/5 Acres		Oct. Nov.	95%		

TOTAL ACREAGE PLANTED:

Marsh and aquatic 1 1/5
Hedgerows, cover patches
Food strips, food patches
Forest plantings

3-1758
Form NR-8
(April 1946)

CULTIVATED CROPS

Refuge Pea Island Year 194 Third Period, 1949

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				Compensatory Services, or Cash Revenue
							Harvested		Unharvested		
					Acres	Bu. Harvested	Acres	Bu.	Acres	Bu.	
Farmed by Refuge Personnel		(1)	Barly Rye Wheat Oats		40	Grown strictly for Geese Browse, no Harvest.					

Summary of Crops Grown:

Crop	Acreage	Permittee's Share		Government's Share				Total Revenue
		Acres	Bushels	Harvested Acres	Harvested Bu.	Unharvested Acres	Unharvested Bu.	$

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Cultivated Crops Report Form NR-8 should be prepared on a calendar-year basis for all crops harvested or utilized during the calendar year and submitted with the December 31 refuge report.

Permittee - List each permittee separately. If lands of the refuge are farmed by refuge personnel or hired labor, this should be indicated in the Permittee column.

Permit No. - List the number of the Special Use Permit issued to the individual.

Use or Location - The Unit No. or name specified in the Economic Use Plan should be listed in this column.

Crops Grown - A separate line of the form should be used for each crop grown by each permittee or by refuge personnel. This is important, since if each crop grown by each operator is not specifically enumerated, the report will be of no value for statistical purposes.

Average Yield per Acre - It is important that the average yield per acre of each crop grown by each operator should be shown.

Permittee's Share - Only the number of acres harvested or 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. It is requested that all crops harvested be reduced to bushels wherever possible, or, as in the case with the harvesting of seed such as that of sweet clover, alfalfa, bromegrass, etc., the total harvested crop in pounds may be shown. Timothy, alfalfa, or other hay harvested by the permittee should be shown on Form NR-10 and should not be shown in the Permittee's Share column.

Government's Share or Return - Harvested - Show the number of bushels harvested for the Government and the acreage from which this share is harvested, both for grain raised by refuge personnel and by permittees. Unharvested - show the exact number of acres of crops allowed to remain unharvested as food and cover for wildlife. An estimate of the number of bushels of grain that is available for the wildlife in such unharvested crops should be shown in the Bushels column.

Compensatory Services, or Cash Revenue - Show other services received by the Government in cooperative farming activities, the number of acres of food strips planted for wildlife, the amount of wildlife crops not otherwise reported that are planted by cooperators for the Service, or the cultivation of wildlife plantations. If the permit is on a fee basis, the total cash revenue received by the Service.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Pea Island Months of Sept thru Dec 1942

(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 USE		
				TRANS-FERRED	SEEDED	FED	TOTAL		SEED	FEED	SURP.
Yellow Corn	00	400	400	00	00	Bait Traps Bu. 40	40	360		Trapping	

(8) Indicate shipping or collection points Matamuskeet and Blackwater Refuges

(9) Grain is stored at In Garage at Overnight Cabin, Pea Island

(10) Remarks

NR-8a 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 lbs., Corn (ear)--70 lbs., Wheat--60 lbs., Barley--50 lbs., Rye--55 lbs., Oats--30 lbs., Soy Beans--60 lbs., Millet--50 lbs., Cowpeas--60 lbs., and Mixed--50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately: Corn, wheat, proso millet, etc. 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 breakdown by varieties of grain listed in Column 6.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters grainary", etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

Form NR-9

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

1620

Refuge Pea Island Year 194 Third Period, 1942

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

3-1760
Form NR-10
(April 1946)

HAYING AND GRAZING

Refuge **Pea Island** Year 194 **Third Period, 1949**

Permittee	Permit No.	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
No such activity on the Refuge									

Totals:

Acreage grazed..... Animal use months..... Total income Grazing.....

Acreage cut for hay..... Tons of hay cut..... Total income Haying.....

Form NR-11

TIMBER REMOVAL

Refuge ~~Pea Island~~ Year 194~~Third Period, 1949~~

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								

Total acreage cut over_____ Total income_____

No. of units removed B. F._____ Method of slash disposal_____

Cords_____

Ties_____

_____

1622

PEA ISLAND NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY 1, 1949 TO AUGUST 31, 1949

U. S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

MANTEO, NORTH CAROLINA

PEA ISLAND NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY 1, 1949 TO AUGUST 31, 1949

CONTENTS

PEA ISLAND NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

MAY 1 TO AUGUST 31, 1949

I. GENERAL

A. WEATHER CONDITIONS

The weather data for this report is taken from the Cooperative Meteorological records of Mrs. Rosa Drinkwater, Manteo, North Carolina. This station is approximately twenty miles north of the refuge.

	Precipitation				Temperatures	
	Actual	Normal	Depart. from Normal		Maximum	Minimum
May	2.24	3.52	- 1.28		90	50
June	4.92	5.30	- .38		96	56
July	3.70	6.26	- 2.56		97	69
August	5.72	5.47	+ .25		91	67
TOTAL	16.58	20.55	- 3.97	Extremes	98	50

This summer may be recorded as one of the hottest on record. For a period of about two weeks the daily temperature was 90 degrees or above. For this section of the country this is extreme heat.

During the month of August we had two hurricane scares. The first one on August 24 gave Pea Island a good lashing but no damage was done. It passed off shore east of Manteo, N. C. about 30 miles.

B. WATER CONDITIONS

During the early part of the period we were not able to maintain high enough water levels in our ponds for good plant growth. Rainfall was deficient on the refuge. At the time that the mainland had 15 inches of rainfall in 24 hours we received none. On another occasion Hatteras received 15 inches in 30 hours but the refuge received none. The lack of rain coupled with the extreme heat resulted in rapid loss of water from our ponds.

At no time however did either of the ponds go dry. During August sufficient rain fell to raise the water levels to a height necessary for good plant growth.

Salinity tests of the North Pond indicate a range of 7.2% at the south end to 17.4% at the north end. At the same time the South Pond tested 1.8% A test of a tidal creek near the north end of the North Pond indicated a salinity reading of 53.7%

C. FIRES

None

II. WILDLIFE

A. MIGRATORY BIRDS

1. Population and Behavior

An estimated 800 Canada Geese were on the refuge as of May 1. They continued to leave the area until by the time of the moulting season during the latter part of July and the early part of August less than fifty remained on the refuge. Some of them were caught for transfer to other areas but due to too much water in the ponds this became increasingly difficult during the season. It is not to be implied that water levels were too high for good vegetative growth but rather that there was too much water to facilitate capture of the birds by running them down.

Most of the geese captured could be considered to be in fair to poor condition. This in spite of the fact that sufficient food was available. No doubt the geese remaining on the refuge are those too weak to make the migratory flight earlier in the season.

Gadwalls, Black Ducks and Blue-winged Teal had an excellent nesting season. You will note on NR-1 an estimate of 540 young ducks produced. Of these 325 were Gadwalls which is, I believe something of a record for this refuge. The crop of black ducks was not unusual. In fact compared with the number of Gadwalls, it was very low since the Blacks usually outnumber the Gadwalls. Three broods of Blue-winged Teal were observed.

Laughing Gulls, Royal Terns, Black-crowned Night Herons, Snowy and American Egrets, Little Blue Heron and the Louisiana Heron, as well as the Common and Least Terns also had nesting colonies on the refuge.

One Willet nest was observed on Jack Shoal. On several other occasions Willets were seen flying as though a nest might be nearby.

Varies species of shorebirds could be observed during the entire period. At one time in June an estimated 1000 Dowitchers were believed to be using the refuge. Others seen in considerable numbers were: Semi-palmated Sandpiper, Yellowlegs, Ruddy Turnstone, and Willets. No Curlews were observed but on one occasion two Oyster Catchers and two Marbled Godwits were seen on the beach.

2. Food and Cover

As reported above under the paragraph entitled Water Conditions, the ponds had some water in them all summer. As a result vegetative growth is good especially the periphery of the ponds and numerous marsh areas on other parts of the refuge have an abundant growth of vegetation.

In pond # 1 (south Pond) there is a lush growth of Bacopa monnieria which was used so extensively last winter by waterfowl. Muskrats have also been observed feeding on this plant. Several species of smartweed, Scirpus americanus and robustus, and Spartina alterniflora, have had a very good growing season. The south pond has a considerable growth of Chara and Potamogeton pectinatus but most of it is small which is believed due to the abundance of algae which surrounds the individual plants and also floats on top of the water thereby cutting off the sunlight.

The north pond has been a fresh-water pond for slightly over a year. An examination of it shows that Chara and Ruppia are the dominant species to be found here. The southern half of the pond has a much better growth of Chara than the northern portion. Most of the Ruppia is found in the deeper water of the western half. In this pond also, there was quite a bit of algae. It may be of interest to know that the strong winds during the night of August 23-24 blew most of the floating algae out of the pond.

In the sound Ruppia can be observed in abundance. Although no large growing beds of eel grass have been seen, windrows of this plant can be observed on the banks of the sound after a westerly wind.

3. Botulism and Other Diseases

None

4. Fur Animals

The writer saw no otter this period. Otter sign can be observed frequently and there have been reports of otter having been seen.

Muskrats are believed to be increasing in the north pond. It is not believed that there has been any change in the south pond.

Mr. F. M. Uhler of the Patuxent Research Refuge thought he had detected sign of raccoon during his visit here in July. To date no raccoon have been seen on the refuge.

III. REFUGE DEVELOPMENT MAINTENANCE

A. PHYSICAL DEVELOPMENT

Better progress was made on the dike repair job than had been

reported during previous periods. A total of 600 feet of dike was built and sprigged. Barring bad storms or dragline breakdowns, the job should be completed by the end of September of this year. Most of the sprigging done during previous years is growing well and is providing good cover.

Some Juncus planting were made on the inside of the dike of the North pond to prevent wave action. These "plantings" were made by cutting Juncus sod and placing it in the desired location. It has made good growth and will have the desired effect in controlling wave action. However much more will have to be planted in order to control erosion completely.

Refuge equipment is being maintained and kept in a state of repair. The refuge boat Redhead II was given a coat of paint inside and out as well as being copper painted on two different occasions this summer.

The ramp over the north dike is in very poor condition. At attempt is being made to maintain it in passable condition pending receipt of landing mat or bridge lumber. At the present time it appears as if used bridge lumber will be the cheapest and may perhaps last until a highway is built down the beach.

Some very necessary repairs were made to the Pea Island Coast Guard Buildings, the use of which was acquired by our service.

The equipment shed at the site of the refuge overnight cabin received a new roof.

With the assistance of Messrs. Harry T. Davis of the N. C. State Museum, and others, a total of over 600 birds were banded. The birds banded were mostly Royal terns, Laughing Gulls, and Skimmers.

Additional Blue Goose and Penalty signs have been set up. Concrete posts are being used for this purpose. They are very suitable and durable for this purpose. Hanger iron such as is used by plumbers in fastening pipes to joists, is used to fasten the shields to the posts.

B. COLLECTIONS

None

IV. PUBLIC RELATIONS

A. REFUGE VISITORS

May 19, 1949	Hayden W. Olds Ben James Rod Amundson	N. C. Wildlife Commission
May 20, 1949	Thomas Carter	FWS, Washington, N. C.
	Albert M. Day	FWS, Washington, D. C.
	Donald J. Chaney	FWS, Washington, D. C.
	Milton C. Hames	FWS, Washington, D. C.
	D. R. Gascoyne	FWS, Washington, D. C.
June 10, 1949	Jack E. Perkins	FWS, Pungo, Virginia
July 12, 1949	F. M. Uhler	FWS, Laurel, Maryland
July 19, 1949	Harry T. Davis	N. C. State Museum, Raleigh, N. C.
	Jack Dermid	N. D. Wildlife Commission
July 20, 1949	John Grey	Charlottesville, Virginia
	J. J. Murray	Lexington, Virginia
Aug. 4-5,1949	Milford K. Thurber	FWS, Atlanta, Georgia
Aug. 8-10, 1949	William P. Baldwin	FWS, Port Wentworth, Georgia
Aug. 13, 1949	Richard F. Dittman	FWS, Atlanta, Georgia

In addition to the above numerous surf fishermen, bird students, and amateur photographers etc. visited the refuge.

B. VIOLATIONS

None

V. OTHER ITEMS

Mr. Houston C. Phillips, Laborer-Patrolman, was transferred from the Reelfoot N. W. Refuge to Pea Island. Mr. and Mrs. Phillips are living in one of the Pea Island Coast Guard Station buildings which were acquired recently by this refuge. His presence on the refuge will be of great value to the refuge manager and to the service.

Mr. F. M. Uhler, Biologist from the Patuxent Research Refuge visited the refuge in July. His visit here is a part of the research program being carried on to determine the periodic losses of Canada Geese on the refuge.

Respectfully Submitted,

Paul W. Sturm

Paul W. Sturm
Refuge Manager

Date Submitted:
September 2, 1949

Approved:

_____

_____

WATERFOWL

Refuge Pea Island Months of May 1 to Aug 31 1949

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Young Produced		(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
I. Swans:									
Whistling swan									
II. Geese:									
Canada goose			300	May 1	25	Aug 17			50
Cackling goose									
Brant									
White-fronted goose									
Snow goose					1	May 18			
Blue goose									
III. Ducks:									
Mallard			350	May 10			15	175	250
Black duck									
Gadwall			400	Aug 17			30	325	400
Baldpate					2	May 21			
Pintail									
Green-winged teal									
Blue-winged teal			50	Aug 17			5	40	50
Cinnamon teal									
Shoveller									
Wood duck									
Redhead									
Ring-necked duck									
Canvas-back									
Scaup									
Golden-eye			10	May 15					
Buffle-head									
Ruddy duck			8	(Observed most of the summer)					
IV. Coot:			25	May 10					25

3-1750
(July 1946)

(over)

Form NR-1

SUMMARIES

Total Production:

Geese _____

Ducks 540

Coots _____

Total waterfowl usage during period 775

Peak waterfowl numbers 1125

Areas used by concentrations Chiefly fresh water ponds

Principal nesting areas this season Higher marsh areas

Reported by Paul W. Sturm
Paul W. Sturm, Refuge Manager

INSTRUCTIONS

(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) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.

(3) Peak Concentration: 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 in the reporting period.

(5) Young Produced: 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.

(6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

2330

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge **Pea Island** Months of **May 1** to **Aug 31** 194**9**

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Heron, Great Blue	Observed throughout period									**25**
Heron, Louisiana								?	50	**50**
Heron, Black-crowned								?	100	**150**
Heron, Little Blue								?	10	**20**
Egret, Snowy			300	Aug 20				?	200	**500**
Egret, American								?	?	**75**
Grebe, Pied-billed	Seen occasionally throughout period									
Rails, Clapper	Occasionally seen; more often heard									
Sora	Observed only occasionally									
Pelican, Brown			15	6/28/49						**15**
II. Shorebirds, Gulls and Terns:										
Sandpiper, Red-backed			800	5/15-21						**1000**
Sandpiper, Semi-palmated			1000	"						**2000**
Sanderlin			150	May						**200**
Plover, Semi-palmated			200	May						**400**
Plover, Upland			2	8/22						
Turnstone, Ruddy			1000	5/15-21						**1500**
Willet			25	Aug						**50**
Yellowlegs	Observed throughout period									**300**
Dowitcher			1000	5/15-21						**2500**
Gulls, Laughing			2000	7/19					300	**2500**
Gulls, Herring			100	7/19						**100**
Terns, Royal			800	7/19					800	**800**
Terns, Least			200	7/19					50	**200**
Terns, Common			500	7/19					100	**500**
Skimmers, Black			300	7/19					100	**300**
Knots			200	5/15						**200**

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Observed occasionally. Not nesting on refuge				
White-winged dove					
IV. Predaceous Birds:					
Golden eagle					
Duck hawk					
Horned owl					
Magpie					
Raven					
Crow	Crows observed on various occasions throughout period				50

Reported by Paul W Sturm

Paul W. Sturm, Refuge Manager

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 Gruiiformes)
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 yound produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Pea Island Months of May 1 to Aug 31, 1949

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
	None									

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.

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Pea Island Months of May 1 thru Aug 31 1949.

(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 USE		
				TRANS-FERRED	SEEDED	FED	TOTAL		SEED	FEED	SURP.
Corn, shelled	6 bu	none	6 bu			3 bu	3 bu	3 bu		X	

(8) Indicate shipping or collection points Elizabeth City, N. C.

(9) Grain is stored at Refuge cabin

(10) Remarks

NR-8a 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 lbs., Corn (ear)--70 lbs., Wheat--60 lbs., Barley--50 lbs., Rye--55 lbs., Oats--30 lbs., Soy Beans--60 lbs., Millet--50 lbs., Cowpeas--60 lbs., and Mixed--50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately: Corn, wheat, proso millet, etc. 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 breakdown by varieties of grain listed in Column 6.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters grainary", etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

BUILDINGS AT PEA ISLAND STATION

GARAGE AND SERVICE BUILDING AT
PEA ISLAND COAST GUARD STATION

THIS BUILDING WAS USED AS A MESS
HALL AND KITCHEN AT THE PEA ISLAND
STATION

Main building at the
Pea Island Coast Guard
Station (abandoned)

Using Jeep pickup to haul
Concrete posts

Loading dragline bucket of
Jeep pickup for repairs

BANDING OPERATIONS

HERDING THE YOUNG ROYAL TERNS INTO THE CHICKEN WIRE CORRAL (ABOVE)

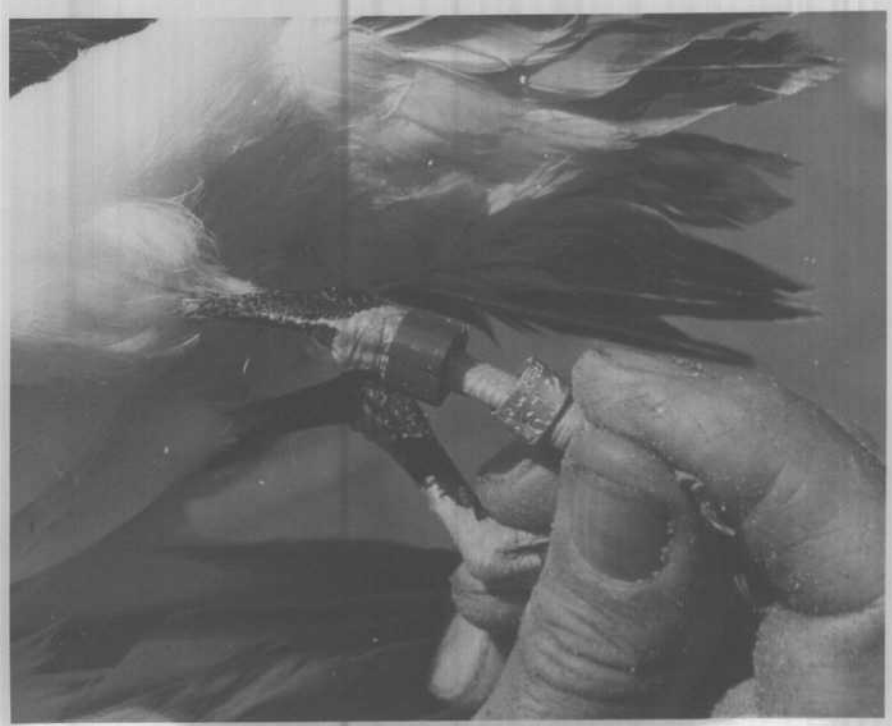
HARRY T. DAVIS, N. C. STATE-MUSEUM AND CORRAL FULL OF ROYAL TERNS

(ABOVE) BANDING OPERATIONS IN FULL SWING

(BELOW) CHASING YOUNG LAUGHING GULLS

(LEFT) BANDING
YOUNG LAUGHING
GULLS

(BELOW) PLASTIC
AND REGULAR BAND
ON ROYAL TERN



PEA ISLAND NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

JANUARY 1 TO APRIL 30, 1949

U. S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

MANTEO, NORTH CAROLINA

PEA ISLAND NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

JANUARY 1 TO APRIL 30, 1949

CONTENTS

PEA ISLAND NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

JANUARY 1 TO APRIL 30, 1949

I. GENERAL

A. WEATHER CONDITIONS

During January and February of this year we had delightful "resort" weather. Twice during January and five times during February the thermometer passed the 70 degree mark. Only once during these two months did the temperature fall as low as 30 degrees.

March, however, brought us cold and blustery weather. On one occasion the temperature was as low as 25 degrees which was also the low for the period.

Rainfall was well dispersed throughout the period. According to the local weather station in Manteo, North Carolina from which we obtain our data, the total rainfall was 8.84 inches. This is 1.60 inches more than we had during the same period last year.

It is believed well to point out again that there are noticeable local variations in the amounts of rainfall. Last year, for example, the roads to the refuge were "sunk" during the months of January, February and the first two weeks of March. In spite of greater recorded rainfall this year, the roads were in excellent condition. Thus not too much credence can be given to the rainfall as recorded in this report.

The following table shows the precipitation and temperature for the first four months of this year:

	Precipitation		Maximum Temperature	Minimum Temperature
	Actual	Dep. from Normal		
January	2.48	- .88	71	30
February	2.66	-1.15	74	34
March	2.04	-1.50	83	25
April	1.66	-1.87	85	41
Totals:	8.84	-5.40	85	25

B. WATER CONDITIONS

The water levels of both the North and South ponds was satisfactory this period. Not only was there sufficient water but the level remained fairly constant throughout the period.

This has been the first winter in several years that the North Pond was covered with fresh water. If the water levels are maintained, this pond should provide excellent feeding grounds for fowl next winter.

Mr. William P. Baldwin, Refuge Management Biologist, tested the water in the ponds and adjacent areas for salinity. The results were as follows:

1. North Pond--North end at dike break which was closed in August 1948 - 15.0%

2. North Pond--South end at gauge (reading 4.25) - 13.4%

3. Salt Creek--outside North pond at dike break - 71.6%

4. South Pond--North end at gauge (reading 4.40) - 1.6%

5. Salt Creek, outside south Pond, west side -59.5%

II WILDLIFE

A. MIGRATORY BIRDS

1. Population and Behavior

This year, as last, the most outstanding attraction on the refuge were the thousands of Greater Snow Geese using the area. As reported in the report for the last period the greatest concentration was at the end of that period. They continued leaving the refuge daily until by January 6 only about 2500 remained and by January 9 all had departed with the exception of about 35. This small group, mostly immatures, remained until the latter part of March. After April 13 no more were seen. According to records in this office, their departure was earlier this year than in previous years.

A check of the areas used by the Snow Geese showed that they feed extensively on Spartina patens and Scirpus americanus and robustus. There was hardly an area on the refuge which was not used by these geese.

At the peak of the season it was estimated that there were 15,000 Canada Geese on the refuge. As in previous years the geese used both the marsh and sound.

Since the scaups and redheads are found at considerable distances from shore, it was impossible to make frequent observations. However, Mr. Thomas M. Carter, Game Management Agent, reports that on his flights over the refuge, they have been frequently observed and according to him they are on the increase. This is also true of the bufflehead, the Black Duck, and The Shoveller. Shovellers preferred the North Pond which is again relatively fresh. During the early hours of the morning when driving the berm of the dike to the dragline, it is believed that as many as 800-1000 could be observed.

Swans have decreased noticeably from the previous year. Red-breasted Mergangers are present in the sound in ever increasing numbers. It's impossible to estimate their numbers with any degree of accuracy.

Unusual was the presence of about 40 skimmers on a shoal in Oregon Inlet during the winter months. South Carolina is usually considered there northermost wintering range.

Sandpipers and Plovers were not observed in any great numbers. They started coming in at the end of the period. The most common were the Semipalmated Sandpipers, Red-backed Sandpipers, Yellowlegs, Black-bellied Plover and occasionally a few Knots, Ruddy Turnstones, and Piping Plovers. Sanderling, Black-bellied Plovers, and Semipalmated Sandpipers were present all winter.

Laughing gulls and Royal terns have arrived in goodly numbers. The herons and egrets have arrived with more coming daily.

2. Food and Cover

Plant foods in the South Pond was limited because of the drought last summer. Nevertheless, it was used most of the period by coots, ruddies and Green-winged teal. These species probably feed on the spike rushes growing in the pond proper. The Blacks, Pintails and Canada Geese feed extensively on smartweeds in the southern portion and on Bacopia moneria which was found both along the eastern and southern parts of the pond. This plant was also used by muskrats. At the beginning of the waterfowl season the borrow pits of this pond had considerable sago pondweed but in time it was pretty well cleaned out.

As previously stated the North Pond was used chiefly ~~used~~ by shovellers also Canadas, Gadwalls and teal could also be observed quite frequently. It is not known what the shovellers were feeding on unless it was molluska because the pond has not had an opportunity to revegetate itself.

Along the eastern edge of the ponds as well as in the area between the ponds, there were excellent stands of Scirpus robustus. Snow geese, Canadas and various species of ducks frequently used these areas. Scirpus americanus is also growing abundantly.

3. Botulism

None

4. Lead Poisoning and Other Diseases

Lead poisoning does not constitute a problem on this refuge. However we have had a serious situation here this spring as a result of geese being found in a weakened condition and the subsequent death of many of them. In previous years February was the month in which most of the geese were effected. This year it began immediately after the cold weather at the beginning of March, reached its peak perhaps two weeks later and then gradually subsided. A very conservative estimate of dead geese is 750 but in all probability the number is closer to 1000.

The writer at first caught all the geese which were observed, force feed them and impounded them. The numbers increased to such an extent that this was found too time consuming, especially so since very few survived. In former years 50% or more survived but this year considerably less than 1% lived.

This problem is one that requires some serious study. Strangely enough ducks and Snow Geese are not effected. Also as a result of the warm weather in January and February there was an excellent growth of grasses. Considerable acreage of marshland was burned providing good but not excellent goose browse. It is believed that if the marsh were burned earlier there might be a better growth by the time the geese really need it. It is also to be noted that last year when we had a severe winter, there were very few deaths, while this year having had a mild winter there were many. But the birds were not seriously effected until after the cold weather in March set in.

On March 29 a dozen geese were flown to the Patuxent Research Station, which in turn placed them under observation with the Department of Animal Husbandry of the Department of Agriculture. On April 20 and 21 Mr. R. L. Griffith of the Washington Office, Miss Marion Farr of the Department of Agriculture, and Mr. F. M. Uhler of the Patuxent Research Refuge were in this area obtaining information. It was hoped that they might still be able to obtain some geese in a weakened condition but only one was found. At the time of their visit only 335 Canadas were observed on the refuge. This compares well with last year when an estimate of 350 were believed to have been here. It must be pointed out that last year no flight was made over the refuge and an estimate is difficult from the ground.

Miss Carr, parisitologist with the Department of Animal Industry, discovered parasites in the blood of birds shipped to the station. These parasites are known to effect ducks but little is known about their reaction in geese.

Mr. Griffith and Mr. Uhler made a study of plant foods and observed that the foods available were not of a very high quality. It was suggested that it might be a worthwhile experiment to cultivate some of the higher marsh areas and sow rye or barley.

The problem of emaciated and dying geese continues to be the main obstacle to good public relations. Last year there was no reason for complaint but this year there was. With a public road running through the refuge and with geese to be found on the road unable to fly or even to walk out of the road, it can be imagined what thereaction is. And this especially since the natives want some excuse for opening the refuge to hunting. They forget that there were serious outbreaks in the early thirties and that this has occurred around Okracoke on at least two occasions.

The writer is happy to know that action is being taken on this matter. He is of the opinion that some action such as the suggestion of cultivating some of the higher marsh area, would have a good effect on the public.

B. Big Game Animals

None

C. Fur Animals

Occasionally an otter or two will be seen. Little is known about the numbers on the refuge. Otter runways, slides and other signs can be observed on a number of places. Since otter have a tendency to seek more "elbow room" when conditions get too crowded, it is believed that their numbers are almost stationery.

Muskrats have declined in the south pond. This is due to the fact that this pond went dry during the drought last summer. On the other hand they are increasing in the North Pond. A few can be observed in other marsh area.

III REFUGE DEVELOPMENT MAINTENANCE

A. Physical Development

Maintenance of equipment again received a great deal of attention. The entire dragline was painted on the outside. This is also true of the pickups. Although the Jeep, being new, did not require overall painting at this time, it nevertheless received a protective coat. As an experiment a coat of S. R. P. 75 was applied before painting the trucks with automobile enamel.

The brakes of both the Jeep and International pickups require constant attention. The sand eats the linings and drums. In addition the salt water freezes the wheel cylinders and adjusting nuts. The International pickup is a problem during hot weather since it has a tendency to run hot. It is thought that a larger radiator may remedy this.

The dike job is continuing but slowly. Several times operations have cease because of lack of funds. On another occasion a week of work was lost because of starter failure and slowness in obtaining repair parts. The bucket was in need of extensive repairs which again required several days. It is still hoped that the job can be completed during this calendar year.

During this period a total of 690 acres were burned under the controlled burning plan. It must of course be understood that the area actually burned was less since within the various plots there were places too marshy and others with too little vegetation to burn. The area which actually received a real good burn may be less than 350 acres.

In the area beginning about 3/4 mile south of the Oregon Inlet Coast Guard Station and continuing southward for about 1 1/2 miles, burning stunted the growth of the Wax myrtle. An excellent burn was obtained over a great part of this area.

The islands in the North Pond were burned with poor results.

Only a narrow strip along the road between the dikes of the south pond burned satisfactorily. After the Snow Geese and Canadas had feed on the marshy area all winter, the stand of grass was too sparse to make burning possible.

An attempt was made to burn the marsh south of New Inlet. But because of the many creeks and low marshy areas this did not prove very satisfactory. Is is doubtful if we obtained as much as a 30% burn.

From the experience of the past two years it is evident that several additions and changes are in order to the controlled burning program. It is the intention to submit these prior to the next burning season.

IV ECONOMIC USE OF REFUGE

None

V. FIELD INVESTIGATION OR APPLIED RESEARCH

This year, as last, we again had visiting the refuge, a party from the Dartmouth College Ecological Society of Hanover, New Hampshire. The group of eight students was under the leadership of their naturalist, Mr. Douglas E. Wade. Their visit extended from March 26

to March 31. While on the refuge they made studies of the muskrat population, studied bird life, collected different species of plants, and made other observations of the flora and fauna.

As reported previously, Mr. R. E. Griffith of the Washington office, Mr. F. M. Uhler of the Patuxent Research Refuge, and Miss Marion Farr of the Agriculture Department visited the refuge with the thought of obtaining information which might solve the problem of emaciated and dying geese.

VI PUBLIC RELATIONS

A. RECREATIONAL USE

Thus far only a few have tried their luck at surf fishing. And those who have tried decided that they were too early or else that there were no fish in the ocean.

B. REFUGE VISITORS

The following were official visitors during this period:

Mr. Richard P. Dittman	Atlanta, Georgia
Mr. Thomas M. Carter	Washington, N. C.
Mr. Roy Ferguson	Lacrosse, Wisc.
Mr. William P. Baldwin	Port Wentworth, Ga
Mr. R. E. Griffith	Washington, D. C.
Mr. F. M. Uhler	Laurel, Maryland
Miss Marion Farr	Beltsville, Md.
Mr. M. A. Reichek	Washington, D. C.

Other visitors were as follows:

Miss Ellen Peters	Brooklyn, N. Y
Miss Henrietta Quigley	New York, N. Y
Mr. Stuart Pritcher	Washington, D. C.
Miss Kathleen Green Shelton	New York, N. Y.
Mr. Ben Eames	Williamston, N. C.
Mr. Jack Ballance	Nagshead, N. C.

C. VIOLATIONS

No arrests were made on the refuge. We were again fortunate having the patrol plane equipped with floats patrolling this area. Refuge Management Agents Roy Ferguson and Tom Carter did a very effective

Without the assistance of the patrol plane is is difficult to do an effective job since violaters can escape by boat when patrolling by land and by land when patrolling by boat. It is very difficult to patrol by using a boat such as the Redhead II since at the south end the shoal extends over a mile out into the sound. .

The effectiveness of patrolling by plane was brought out by the local wildlife club which opposes the use of the plane because "the noise from the engines kept the fowl on feeding grounds in a constant state of confusion". Reports from the agents indicate that is is not the fowl which are confused but the hunters.

D. OTHER

Contacts were made with members of the local wildlife club and others regarding the emaciated and dying geese. The club maintains that hunting will solve the problem and has as its main aim the opening of the refuge to hunting. They forget that these outbreaks occurred prior to establishment of the refuge and also that there have been occurrences of this nature in the vicinity of Ocracoke, N. C. It is evident that the reason for wanting to hunt on the refuge is to kill more geese and not to save them.

Date Submitted:

May 3, 1949

Respectfully submitted

Paul W. Sturm

Paul W. Sturm
Refuge Manager

Approved:

_____

HIGHLIGHTS OF THE YEAR ACTIVITIES

Perhaps the outstanding feature of the years activities is the fact that the North Pond is again in use as a fresh water pond. During August of last year a temporary dike was built across the break thus preventing the flow of salt water into and out of the pond proper.

During the year we had one major overhaul and repair job on the dragline and many minor ones. Several times we had to cease operations due to lack of funds and on other instances repair parts had to be ordered which again brought operations to a standstill.

The concrete posts which were stored at the old CCC compsite north of Manteo have been removed to Pea Island and to Mattamuskeet refuge.

The old Stead Ridge Lodge buildings near the south end of the refuge have been put up for bid and will be disposed of shortly.

The old 1 1/2 ton Ford Stake truck and the Chevrolet pickup were disposed of and a Jeep truck with four-wheel drive obtained as a replacement. The Jeep has been found very successful on the beach.

As a result of many geese dying on the refuge this spring, research is being done to determine the reason for the geese becoming emaciated and the subsequent death of many of them.

Maintenance work is continuing as in previous years. This includes the painting and repair of pickups and boats and buildings.

Some sprigging has been done on the sand fence and an attempt is made to control wave action on the berm of the dike of the North Pond.

Pierced -plank landing mat was placed on the roadway over one of the dikes. Another ramp is wearing out. If additional matting can be obtained, it will be placed and the old bar and rod mats removed.

WATERFOWL

Refuge Pea Island Months of January 1 to April 30 1949

(1) Species		(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Young Produced		(6) Total
	Common Name	Number	Date	Number	Date	Number	Date	Broods Seen	Estimated Total	Estimated for Period
I.	Swans:									
	Whistling swan			55	1/3/49	18	2/28/49			50
II.	Geese:									
	Canada goose			15000	1/14/49	300	4/30/49			20000
	Cackling goose									
	Brant									
	White-fronted goose									
	Snow goose			8000	1/1/49	2	4/13/49			8000
	Blue goose			5	1/1/49					5
III.	Ducks:									
	Mallard			3000	1/14/49	400	4/30/49			3000
	Black duck									
	Gadwall			350	3/28/49	40	4/27/49			350
	Baldpate	Seen only occasionally								
	Pintail			1800	1/14/49	150	3/15/49			1300
	Green-winged teal			600	2/9/49	125	3/24/49			600
	Blue-winged teal			125	2/22/49	25	4/27/49			125
	Cinnamon teal									
	Shoveller			1000	2/28/49	50	3/28/49			1000
	Wood duck									
	Redhead			1000	2/14/49					1000
	Ring-necked duck									
	Canvas-back									
	Scaup			2000	1/14/49	6	4/28/49			2000
	Golden-eye									
	Buffle-head			1500	1/14/49					1500
	Ruddy duck			500	1/14/49		3/12/49			500
IV.	Coot:			250	1/14/49	5	4/30/49			250
	Mergansers, Red-br									50000

3-1750
(July 1946)

(over)

Form NR-1

SUMMARIES

Total Production:

Geese _____

Ducks _____

Coots _____

Total waterfowl usage during period 90,188

Peak waterfowl numbers 35,168 (exeluding mergansers)

Areas used by concentrations entire refuge

_____

Principal nesting areas this season _____

_____

Reported by Paul W. Sturm

Paul W. Sturm, Refuge Manager

INSTRUCTIONS

(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) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.

(3) Peak Concentration: 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 in the reporting period.

(5) Young Produced: 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.

(6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.

2338

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Pea Island Months of January 1 to April 30 1949

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Cormorant, Double-Cr	400	4/14/49	400	4/14	200	4/30				600
Heron, Great Blue	Occ. throughout		8	4/30						10
Heron, Louisiana	period		12	4/30						15
Heron, Bl-crowned Night	"	"	20	4/30						20
Egret, Snowy	16	3/28	50	4/30						50
Egret, American	2	3/28	4	4/30						4
Loon, Common	OCCASIONALLY SEEN THROUGHOUT PERIOD									
Bittern, American	"	"	"	"						
Grebe, Horned	"	"	"	"						
Grebe, Pied-billed	"	"	"	"						
Rail, Clapper	Occasionally heard since March 15									
Sora	Occasionally seen since March 15									
II. Shorebirds, Gulls and Terns:										
Sandpiper, Least and/or semipalmated	Throughout per.		300	4/6/49						500
Sandpiper, Red-backed	6	1/15	150	4/11/49						150
Sanderling	Throughout per		200	4/11/49						400
Yellow-legs			50	4/11/49						75
Gull, Great Bl.Backed			150	2/28/49	3	3/25				150
Gull, Laughing	10	3/28	600	4/30/49						600
Tern, Royal	2	3/28	200	4/30/49						200
Willet	2	3/28								
Skimmer, Black	Throughout period		40							
Gannet	"	"	150	3/16/49						150
Killdeer	Occasionally throughout period									
Sandpipers and plovers unidentified										750
Plover, Black Bellied	Throughout per.		100	2/22/49						150

(1)	(2)		(3)		(4)	(5)	(6)
III. Doves and Pigeons:							
Mourning dove	Occasionally seen since March 18						
White-winged dove							
IV. Predaceous Birds:							
Golden eagle							
Duck hawk	Throughout period		8	2/17			17
Horned owl							
Magpie							
Raven							
Crow (fish)	8	3/26	20	4/ 18			20

Reported by Paul W. Sturm

Paul W. Sturm, Refuge Manager

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 Gruiiformes)
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 speoies using the refuge during the period concerned.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Pea Island Refuge Months of January 1 to April 30, 19[illegible]

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
NOT APPLICABLE TO THIS REFUGE										

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, 1949

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5) Total Population
								Share Trapping						
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	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
Muskrat	Cattail, Scirpus robustus and americanus and Spartina patens ***		NO REMOVALS											350
Otter	Marsh		NO REMOVALS											10

*** Chief concentration of muskrats is in South Pond (# 1) where they decreased during the year, and in the North Pond (3#) where there has been an increase.

* List removals by Predator Animal Hunter

REMARKS:

Reported by [signature]

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 headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

PILOT-AGENT ROY FERGUSON AND AGENT TOM CARTER WITH FLOAT PLANE USED IN PATROLLING

NEWLY BUILT AND SPRIGGED DIKE. DRAGLINE IS BETWEEN STOCKPILES WORKING ON SECOND CAST OF THREE REQUIRED TO BUILD DIKE.

MESSRS WILLIAM P. BALDWIN, REFUGE MANAGEMENT BIOLOGIST AND STUART KRITCHER AT ONE OF THE MUSKRAT HOUSES IN SOUTH POND

SNOW GOOSE "EAT OUT" IN MARSH OF NORTH POND

MESSRS. REICHEK AND CARTER AND MISS FARR ON REFUGE INVESTIGATING EMACIATED AND DYING GEESE

MESSRS. MIDGETT, UHLER AND GRIFFITH AT DRAGLINE LOCATION. MESSRS. UHLER AND GRIFFITH OBTAINING INFORMATION ON GEESE.

THIS HELICOPTER LANDED IN "FRONT YARD" AT REFUGE CABIN. IT CARRIED MR. GRIFFITH AND PARTY TO REFUGE FROM ELIZABETH CITY, N. C.

WAVE ACTION ON BERM OF DIKE OF NORTH POND. PLANTING JUNCUS SOD TO CONTROL THIS IS MEETING WITH SUCCESS

BURNING MARSH BETWEEN NORTH POND
AND COAST GUARD STATION
SEE PAGE 6