

REFUGE NARRATIVE REPORT
CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE
SEPTEMBER TO DECEMBER 1960

GENERAL

A. WEATHER CONDITIONS:

<u>MONTH</u>	<u>PRECIPITATION</u>	<u>NORMAL</u>	<u>MAXIMUM TEMPERATURE</u>	<u>MINIMUM TEMPERATURE</u>
SEPTEMBER	3.37	4.14	94	52
OCTOBER	3.21	2.46	89	33
NOVEMBER	.91	2.80	78	28
DECEMBER	2.58	3.46	72	15
TOTAL:	<u>10.07</u>	<u>12.86</u>		
NORMAL:	<u>12.86</u>		Extremes (94)	(15)
SHORTAGE:	2.79			

September was a dry month with a shortage of rainfall. Hurricane Donna however dumped almost two inches of rain on us on the 11th. No serious damage was done as a result of Donna's visit. We had adequate rainfall during October. The 1st frost was registered on the 25th of the month. There was a deficiency of rainfall during November. Cooler weather was experienced during the close of the month with cloudy weather bringing some degree of moisture. December was a cold month with a shortage of rainfall.

B. HABITAT CONDITIONS:

1. Water: The water levels in the lakes and ponds were maintained despite the shortage or below rainfall for the period. The calico slide gate in Lake Bee busted, emptying the lake.

2. Food and Cover: During the period and at this writing, food and cover are sufficient for the population inhabiting the refuge. Corn and browse for the geese and ducks is adequate. Millets, buckwheat, sesame, peas, chufas and milo produced a good crop. Wheat grown on the refuge (for seed) was used to plant browse in the waterfowl area and was preferred over oats and rye. Ryegrass was over seeded on areas adjacent to Martins and Ox Pen lakes and browsed heavily.

The production of native foods was good. The scrub oak called turkey oak produced the best crop of acorns this year. Various native plants, partridge peas, poison ivy, persimmon and native grasses furnished food for all species of wildlife.

There is excellent cover for all types of wildlife inhabiting the refuge.

II. WILDLIFE

A. MIGRATORY BIRDS:

Nine Canada Geese arrived on September 26th this season. This was eleven days earlier than last season and seems to be the earliest date of arrival here.

The highest average for a reporting week this period is 1000 compared to 800 for the same period last season. The duck population has more than trippled from last seasons report. The peak reached 2050 for a report week this season.

Waterfowl seem to prefer the Martins Lake area but have consumed ^{A portion of the} ~~the~~ corn prepared for their use at the Ox Pen area. They have also used the browse area at Ox Pen. Ducks prefer the marshy area at the head of Martins Lake but feed in the cornfields along with the geese.

The dove population for the period of this report seems to be below that of the last report covering a comparable period. No explanation of the difference can be made because there seems to be ample food and cover.

B. UPLAND GAME BIRDS.

The turkey population seems to be holding its own and there might be a slight increase to report. Plans are being made to make a count and try to determine the population. Food is still sufficient for the population. The chufa seed patch along with other chufa plantings furnishes plenty of food.

There does not seem to be a noticable change in the quail population. Food and cover seems to be sufficient for the number present.

C. BIG GAME ANIMALS.

The deer population is on an increase and are inhabiting more areas outside the refuge. Some depredation to corn, watermelons, peas and other crops have been reported but it is not an alarming situation. The hunter kill on adjacent lands seems to compensate for the depredations. From reports more deer were killed this season than last year.

The albino deer has not been observed in over twelve months.

D. FUR ANIMALS, PREDATORS, RODENTS AND OTHER MAMMALS.

During this report period the trapping program was not in full swing. Only a few days and a few traps were used as compared to this corresponding period last year. The catch consisted of 3 red foxes, 5 grey foxes, and 10 raccoons as compared to last years 27 red foxes, 40 grey foxes, 13 bobcats, 55 raccoons, 13 o'possums, 15 skunks and 1 house cat. Plans are being made to begin trapping during the first week in January.

There seems to be no noticable change in rodents and other mammals on the refuge.

E. HAWKS, EAGLES, OWLS, CROWS, RAVENS AND MAGPIES.

These birds have done no appreciable damage during the period.

F. OTHER BIRDS.

The changes under this group are minor and not worth mentioning in this report.

G. FISH.

There was a noticeable decrease in the days spent fishing on the refuge. The reduction in sales of permits indicates that but may not give a true picture of the fishing pressure. We have not had reports of extra large fish or extra large numbers of fish being caught. Some who went fishing caught fish and others did not. The lakes seemed to be at their best for fishing, weeds were depressed by the fertilization program carried out and all showed good prospects of fish being caught.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. PHYSICAL DEVELOPMENT.

During the period truck trails, roads and entrances to lakes were maintained. Clay was hauled and placed on extremely sandy hills of some of the truck trails and roads. Sand and gravel was hauled to replace that removed by erosion on the road leading to quarters number four.

B. PLANTINGS.

1. Aquatic and marsh plants: None
2. Trees and shrubs: None
3. Upland Herbs: None
4. Cultivated crops:

All cultivated crops produced a better than average yield for the refuge. The corn crop averaged above 40 bushels per acre. The millets, buckwheat, sesame, peas, combine milo and chufa planted in food patches produced a good yield. Wheat, oats, rye and ryegrass planted, (some of it on sericea sod and without land preparation) has furnished excellent browse. Seven acres of chufas, harvested for seed produced 200 bushels of cleaned chufas.

The following acreage of crops were cultivated by refuge personnel for fall and winter food for wildlife: 80 acres of millets, buckwheat, chufas, cowpeas, sesame, and grain sorghum, 40 acres of corn, 120 acres of browse (wheat, oats, rye and ryegrass), and 95 acres of crotalaria for soil improvement. The plantings of clover have furnished wildlife food during the fall and winter months.

Cooperative farming agreements included the following crops which benefited wildlife directly or indirectly: 60 acres of corn, 12 acres of watermelons, 2 acres of trucks, 12 acres of cotton, 1.18 acres of tobacco, 15 acres of soybeans, 230 acres of rye and 36 acres of bicolor lespedeza. Agricultural crops not beneficial to wildlife were compensated for by the planting of grain crops for wildlife use.

Special Use permit involving approximately 700 acres in the Ox Pen area is planted to crops which benefit wildlife. These crops include grasses, sericea, fescue, ladino clover and native grasses.

C. COLLECTION OF RECLIMTS.

None

D. CONTROL OF VEGETATION.

None

E. FIRES:

No fires during this period.

IV PUBLIC RELATIONS

A. RECREATIONAL USES:

There was picnicking at the Lake Bee area and fishing in all lakes open to fishing.


B. REFUSE VISITORS:


Mr. and Mrs. Thomas Drudy - Boston, Mass.	Sept. 6, 1960.
Mr. Victor W. Kay - Asst. Regional Supervisor	Sept. 9, 1960.
Mr. S. C. Gaines, Columbia, S. C.	Sept. 15, 1960.
Mr. Ken Harney - Chesterfield, S. C.	Sept. 16, 1960.
Mr. Floyd Moody - Dillon, S. C.	Sept. 21, 1960.
Mr. Lawrence S. Olivers - Regional Supervisor	Sept. 23, 24, 1960.
	Oct. 13, 1960.
Mr. H. H. Scott - S. C. Forestry Commission, Columbia, S. C.	Sept. 28, 1960.
Mr. M. N. Cate - S. C. Law Enforcement Div. Columbia, S. C.	Oct. 7, 1960.
Mr. James C. Allen - Latta, S. C.	Oct. 5, 1960.
Mr. Carl B. Stokes - S. C. Law Enforcement Div. Columbia, S. C.	Oct. 7, 1960.
Mr. Charles Boan - Pope Veneer Co., Camden, S. C.	Oct. 12, 1960.
Mr. Lester E. Scherer - Administrative Officer	Oct. 13, 1960.
Mr. Earl F. Hampton - Fiscal Acctg. Officer	Oct. 13, 1960.
Mr. J. T. Burch - State Game Dept., S. C. Columbia, S. C.	Oct. 18, 1960.
Mr. W. R. Jones - State Game Dept., S. C. Columbia, S. C.	Oct. 18, 1960.
Mr. Jimmy Bedenlaugh - Newberry, S. C.	Oct. 20, 1960.
Mr. Randolph B. Lee, Director Sandhills State Forest	Oct. 20, 1960.
Mr. Verlon Carter - Regional Forester	Nov. 28 to Dec. 1, 1960.
Mr. Philip G. Van Dyck - Asst. Reg. Supervisor	Nov. 28 to Dec. 1, 1960.
Mr. Thurmond O. Chaffin - U.S. Fish Cultural Sta. Cheraw, S. C.	Dec. 8, 1960.
Mr. James J. Joyner - Bethune, S. C.	Dec. 8, 1960.
Mr. Zack S. Nichols - Hartsville, S. C.	Dec. 8, 1960.
Mr. Troy C. Usher - Hartsville, S. C.	Dec. 8, 1960.
Mr. W. H. Rhodes - Sandhills Exp. Station, Columbia, S. C.	Dec. 9, 1960.

C. REFUGE PARTICIPATION:

Daily contact with the public was the only public relations participated in by Refuge Personnel.

SUBMITTED: January 11, 1961.


Ernest F. Holland,
Refuge Manager.


Approved: Victor W. Kay
Act. Regional Refuge Supervisor
Jan. 13, 1961

1960.

A. **Carolina Sandhills**

B. Total number of days of visitation **5,475**

1. Number of days of visitation having no effect on the area

2. Number of days of visitation having no effect on the area **None**

3. Number of days of visitation having no effect on the area

Estimated visitor-days **2,475**

3. Miscellaneous (days of visitation having no effect on the area, including days of visitation having no effect on the area for business or official use, including other days such as hunting or trapping.)

Estimated visitor-days **3,000**

C. Remarks.

January 11, 1961.

Date

Emmett H. Lee

Range Manager

W A T E R F O W L

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF September TO December, 19 60.

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
<u>Swans:</u>										
Whistling										
Trumpeter										
<u>Geese:</u>										
Canada						150	275	275	400	550
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
<u>Ducks:</u>										
Mallard										15
Black										50
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood						50	50	50	50	50
Redhead										
Ring-necked										75
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<u>American Bidgeon</u>										25
<u>Coot:</u>										

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

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

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF September TO December, 19 60.

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production :Broods:Estimated : seen : total	
	11	12	13	14	15	16	17	18			
<u>Swans:</u>											
Whistling											
Trumpeter											
<u>Geese:</u>											
Canada	550	600	700	700	900	1000	900	900	55,300		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
<u>Ducks:</u>											
Mallard	15	55	300	1600	1700	1700	1700	1700	61,495		
Black	50	100	200	400	250	250	300	300	13,300		
Gadwall											
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood	50	50	50	50	50	50	50	50	4,550		
Redhead											
Ring-necked	75	80							1,610		
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
<u>American Bidgeon</u>	25	30							560		
<u>Coot:</u>											
				25	(over) 25		25	25	700		

	(5)	(6)	(7)
	<u>Total Days Use</u>	<u>Peak Number</u>	<u>Total Production</u>
Swans			
Geese	55,300	1000	
Ducks	81,515	2050	
Coots	700	25	

SUMMARY

Principal feeding areas Ox Pen Lake, Martins Lake

developments.

Principal nesting areas _____

Reported by

Ernest F. Holland

Ernest F. Holland, Refuge Manager.

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

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

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Carolina Sandhills

Month of September

to December

19 60

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Great Blue Heron	2	Jan	5	June to August	1	Dec.				10
American Egret	2	Jan	7	July to August	1	Dec.				14
Snowy Egret	1	Jan	18	June & July	2	Dec.				22
II. <u>Shorebirds, Gulls and Terns:</u>										

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	resident	2,110			5,500
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	resident resident				10 170
Reported by <i>Amelia J. Hill</i>				nest 1. hollow, close by ar.	

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)
II. Shorebirds, Gulls and Terns (Charadriiformes) & Gruiformes)
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 Carolina Sandhills National
Wildlife RefugeMonths of September to December, 1960.

(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'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
E. Bob white quail	40,000 A (All types)	10	30	2,000	45M 55F				40,000 ?	
E. Wild Turkey	40,000 A (All types)	285	3	60					140	

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.

BIG GAME

Refuge Carolina Sandhills N/W Refuge Year 1960

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population as of Dec. 31	(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Losses	Number	Source		Percentage
White-tailed Deer	46,000 (All Types)	160										700	

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: Applies particularly to those species considered in removal programs (public hunts, etc.) exclusive of fenced herds. 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 as of December 31.
- (8) SEX RATION: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1755
Form NR-5
(April 1946)

DISEASE

Refuge ~~Carolina Sandhills National Wildlife Refuge~~ Year ~~194~~ 1960.

Botulism

Lead Poisoning or other Disease

Period of outbreak.....			Kind of disease.....		
Period of heaviest losses.....			Species affected.....		
Losses:			Number Affected		
	Actual Count	Estimated	Species	Actual Count	Estimated
(a) Waterfowl	.....	.....	.....	.....	.....
(b) Shorebirds	.....	.....	.....	.....	.....
(c) Other	.....	.....	.....	.....	.....
Number Hospitalized	No. Recovered	% Recovered	Number Recovered.....		
(a) Waterfowl	.....	.....	Number lost.....		
(b) Shorebirds	.....	.....	Source of infection.....		
(c) Other	.....	.....	Water conditions.....		
Areas affected (location and approximate acreage).....			Food conditions.....		
Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.).....			Remarks.....		
Conditions of vegetation and invertebrate life.....			None observed		
Remarks.....			None observed		

3-1756
Form NR-6
(April 1946)

FISH

Refuge ~~Carolina Sandhills National Wildlife Refuge~~ Year ~~1951~~ 1960.

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	
Large Mouth Bass	Common	250	700					
Small Mouth Bass	Rare	0	0					
Bream (Bluegill & Sunfish)	Common	1200	1600					
Jack (E. Pickerel)	Common	200	350					
Wormmouth Bass	Common	400	800					
Cat Fish	Common	425	850					

REMARKS:

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Carolina Sandhills National Wildlife Refuge
Refuge.....Year 194.....

1960.

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
Wheat, oats, rye Brown top millet German millet Sesame, Buckwheat Chufas, peas and combine also mixed Chufas Corn	over refuge T19 & 5 C. Pen & Martins		120 80 7 40		Sept-Dec May-July June April & by March to June June Nov. Nov.	good good good good good good good		for seed
Crotalaria	over refuge		95					
Peas Wheat Ryegrass	Near Hd 1.		8 6 10					for seed 44 at Hd 2.

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches.....366
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 Carolina Sandhills National Wildlife Refuge County Claytonfield State South 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			
Wheat			10	85 Bu.			10	Wheat H&C	10
Corn	40.4	1015 Bu.	19.6	323 Bu.	40	200	100	Ryegrass H&C	10
Watermelons	12	50 tons					12	Rye, wheat & oats	
Bicolor lespedeza	36	12 bu.					36	for G/I and C&B	120
Rye	183.7	1260 bu.	45.9	315 bu.			229.6		
Cotton	12	1.5 tons					12	vetch (c)	7
Tobacco	1.18	.60 tons					1.18	clover white H&C	8
Soybeans	11.25	212 bu.	3.75	68 bu.			15	clover ladino H&C	5
Garden	2	1 ton					2		
Peas			8	28 bu.			8		
Chufas	7	200 bu.			155	705	7		160
Brown top millet	420	294.1	220	1019			549		
German millet, sesame, buckwheat, chufas and combine milo					80	400 bu.	80	Fallow Ag. Land	
Lespedeza Sericea					35	105 tons	35		

No. of Permittees: Agricultural Operations 4 Haying Operations None Grazing Operations 1

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	100	1200		300
				2. Other				
				1. Total Refuge Acreage Under Cultivation				707.78
Hay - Wild				2. Acreage Cultivated as Service Operation				366

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 ~~Carolina Sandhills National Wildlife Refuge~~ Months of ~~Sept.~~¹⁹⁴ thru ~~Dec.~~¹⁹⁴ ~~1960.~~¹⁹⁴

(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.
Chufas		200 bu.	200 bu.					200 bu.	50 bu.		*150 b u.
Oats	30 bu.		30 bu.		30 bu.		30 bu.				
Rye	333 bu.		333 bu.	100 bu.	223 bu.		323 bu.	10 bu.	10 bu.		
L. bicolor	740 lbs.	500 lbs.	1240 lbs.					1240 lbs.	240 lbs.		1000 lbs.
L. sericea	5460 lbs.		5460 lbs.					5460 lbs.	1,000 lbs.		**4460 lbs.
Wheat	85 bu.	12 bu.	97 bu.		97 bu.		97 bu.				
Cowpeas		28 bu.	28 bu.					28 bu.	28 bu.		
Corn		323 bu.	323 bu.							323 bu.	
Soybeans		68 bu.	68 bu.						68 bu.		
Ryegrass		1,000 lb.	1,000 lb.		800 lbs.		800 lbs.	200 lbs.	200 lbs.		

- (8) Indicate shipping or collection points.....
- (9) Grain is stored at.....
- (10) Remarks * includes 75 bu. for S. Florida and 5 bu. for U. S. Forest Service. ** Includes 500 lbs. for Santee Refuge.

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.

COLLECTIONS AND RECEIPTS OF PLANTING STOCK
(Seeds, rootstocks, trees, shrubs)Refuge Carolina Sandhills National Wildlife Refuge Year ~~195~~ 1960.

Species	Collections				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period or Collection	Method	Unit Cost	Amount	Source		
		<u>NONE</u>						

REFUGE NARRATIVE REPORT
CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE
MAY TO AUGUST 1960

GENERAL

A.

WEATHER CONDITIONS:

MONTH	PRECI- PITATION	NORMAL	MAXIMUM TEMPERATURE	MINIMUM TEMPERATURE
MAY	2.30	3.32	95	42
JUNE	2.49	3.86	100	54
JULY	8.92	5.40	99	61
AUGUST	7.17	5.36	96	62
Total:	20.88	17.94		
Normal:	17.94			
Overage:	2.94			

WEATHER:

Dry weather continued from the last period into May. A hailstorm was experienced during May causing slight damage to the local peach crop. Some farmers complained all out of proportion to the actual damage. In spite of this peaches were in abundance and market prices not as plush as former years. June was a hot, dry month showing a deficiency in rainfall and soil moisture. Crops were generally in a near critical state. Local farmers fortunate enough to have irrigation units used this method generously to off-set the lack of rainfall. Many crops were damaged by this severe drought condition and plantings had to be done over. The months of May and June were not favorable to any farming activity. The drought conditions were finally broken with ample precipitation during the month of July. We did experience two periods of dry weather during July but this was not serious enough to cause any damage to crops and such periods were broken by ample rainfall. During the month of August the weather was hot and humid with a above average of rainfall. Crop at the end of August looked good.

B.

HABITAT CONDITIONS:

1. Water: The recommended water level was maintained in all impoundments except Lake Bee. The Lake Bee level was being kept at about 2/3 capacity by the use of the calico slide gate in order to prevent further erosion where the dam is washed away and the gate busted, draining the lake.

2. Food and Cover: There was an ample supply of food for turkey, deer doves, quail and other birds. The strips planted to oats, wheat, rye, clover, millet, buckwheat, combine milo and peas were frequented by all types of wildlife. Chufa plantings which matured last fall furnished food for turkey, and other wildlife during the period. The below normal rainfall during May and June was beginning to damage plantings made during that period but rainfall since that time has given an abundant crop for wildlife to feed on.

II WILDLIFE

A.

MIGRATORY BIRDS:

The wood duck population has not changed from previous seasons. They are seen mostly in pairs on the lakes and streams in the area. No large numbers have been observed.

The dove population during the period seemed to be low. Dove were not observed in large numbers at any time during the period. A total of 44 doves were banded this period. Compared to 222 for the corresponding period last year. The trapping record does not seem to give an accurate picture of the population. From observations made there was no alarming decrease from last season.

B.

UPLAND GAME BIRDS:

The population of Eastern Wild Turkey seems to be on the increase. Broods of as high as 8 young have been observed in areas not frequented by turkey previously. One brood was observed on two occasions within 1/4 mile of headquarters on TT8.

According to daily observations quail are as plentiful as they were during this period last season. Quail are observed where there is suitable habitat such as food, water and plenty of cover.

C.

BIG GAME ANIMALS:

The deer population is satisfactory from a numbers standpoint. From reports the population outside the refuge area has increased since last season. Reports of depredations to watermelons and cowpeas have come in during the period. A deer carrying a fawn was killed by a vehicle on highway 85 and observed on July 8, 1960.

Hunting pressure adjacent to the refuge seems to be on the increase each season.

D.

FUR ANIMALS, PREDATORS, RODENTS AND OTHER MAMMALS:

Predators, rodents and other mammals are numerous on and off the refuge. There have been reports of unwarranted work done by Beaver outside the refuge area. Raccoons damaged the chufa nursery by digging the chufas as they were germinating and re-planting was necessary. Beaver are persistent in their work on the streams and around the impoundments of the refuge. The O'Possum population shows no change from last season. Cotton-tailed rabbits have been observed killed along the highways.

E.

HAWKS, EAGLES, OWLS, CROWS, RAVENS AND MAGPIES:

The predacious bird population of the refuge is not enough to be alarmed about. The red-tailed hawk is the predominate species. Crows seem to be holding their own with no noticable damage to the refuge farming. Reports from adjacent farmers indicate damage to watermelons by crows.

F.

OTHER BIRDS:

There is no noticable difference in birds under this heading.

G.

FISH:

There has not been as much fishing in the lakes during this period as there was the previous corresponding period. Sale of permits have dropped off. The decrease in fishing pressure may be due to the lake constructed south of the refuge on Black Creek by the Carolina Power and Light Co. The lake is known as Lake Hartsville and is the largest lake in this area comprising ~~25~~ about 2,500 acres of water.

Fertilization of the lakes has continued but the desired growth of algae has been disappointing. This is probably due to excessive run-off caused by heavy and frequent rains.

H.

REPTILES:

Not applicable.

I.

DISEASES:

No report of diseases this period.

III REFUGE DEVELOPMENT AND MAINTENANCE

A.

PHYSICAL DEVELOPMENT:

Clearing operations at Ox Pen area was begun during this period. Forty acres of upland and marsh area are to be cleared off and planted this fiscal year. Removing some of the brush ties existing fields together, thereby giving better utilization of them.

Roads were graded and clay added to some of the sandy spots and bushes cut out of the curves.

Three No. 12 refuge signs were completed for Sabine Refuge and shipped to Sabine. 46 Refuge signs were completed since the Sandhills Refuge started making Refuge signs for the Region. Carolina Sandhills Refuge started this project in December of 1952.

B.

PLANTINGS:

1. Aquatic and Marsh plants: None
2. Trees and shrubs: None
3. Upland Herbs: None
4. Cultivated Crops:

Plantings of millet, chufas, cowpeas, buckwheat, sesame and combine milo were completed in July of this period. In most cases a mixture of all the crops was put in each plot. The plots are distributed over the central part of the refuge and in areas frequented by turkey, and other wildlife species. Eight acres of peas were planted for seed harvest.

During the period the planting of corn at Ox Pen and Martins lake area was completed.

Total approximate acreage planted during the report period was as follows:

Eighty acres to millet, buckwheat, chufas, cowpeas, sesame and combine milo. Seventy acres to crotalaria. Twenty acres to corn. Seven acres to chufas for harvest. The total acreage of corn planted since January is 40 acres and total for crotalaria 95 acres.

C.

COLLECTION OF RECEIPTS:

None

D.

CONTROL OF VEGETATION:

None

E.

FIRES:

No fires occurred on the refuge during this period.

IV PUBLIC RELATIONS

A.

RECREATIONAL USES:

Recreational uses consisted of fishing in lakes, picknicking at Lake Bee and bird watching by different parties.

B.

REFUGE VISITORS:

Professor Daggy - (With Students-5) Davidson College, N.C. May 8, 1960
 Mr. William C. Lehmann - US Game Management Agent, N. Charleston May 11, 1960
 Mr. Eickenbacker - Summerton, S. C. May 13, 1960
 Mr. Hunicutt - Summerton, S. C. May 13, 1960
 Mr. Philip G. Van Dyke - Asst. Reg. Supervisor May 27-28, 1960
 Mr. William C. Lehmann-US Game Management Agent, N. Charleston - June 8, 1960
 (With 16 members of the S. C. Conservation Summer Camp)
 Mr. E. C. Pickens - S. C. Forestry Commission, Columbia, S.C. June 9, 1960
 Mr. H. R. Scott - S. C. Forestry Commission June 9, 1960
 Mr. Charles H. Flory - S. C. Forestry Commission June 9, 1960
 Mr. Randolph B. Lee - Sandhills State Forest-Patrick, S. C. June 9, 1960
 Mr. Robert E. Lines - Branch of Realty- Reg. Supervisor June 9, 10, 1960
 Mr. Lawrence S. Givens-Branch of Refuges-Reg. Supervisor June 9, 10, 1960
 Mr. Ben W. Mangum - Chesterfield June 13, 1960
 Mr. William A. Ried - Santee Refuge June 16, 1960
 Mr. Gene Barrett - Santee Refuge June 16, 1960
 Mr. and Mrs. W. E. Basnight-Swanquaters Refuge, N. C. July 12, 1960
 Mr. and Mrs. R. O. Gustafson - Sacramento, California July 15, 1960
 Mr. William M. Hearn - Columbia, S. C. July 19, 1960
 Mr. Smith M. Camp - Asst. District Agent-Predator & Rodent Control August 18, 1960

C.

REFUGE PARTICIPATION:

The only public relations participated in by refuge personnel was their daily contact with the public. There are numerous questions asked by sightseers and visitors on the refuge.

SUBMITTED: September 12, 1960

APPROVED:

Bj Philip S. Van Dyk
Act- Regional Refuge Supervisor

SEP 14 1960
SEP 14 1960

Ernest F. Holland

ERNEST F. HOLLAND,
Refuge Manager.

W A T E R F O W L

REFUGE Carolina Sandhills N. W. Refuge

MONTHS OF May TO August, 19 60

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
<u>Swans:</u>										
Whistling										
Trumpeter										
<u>Geese:</u>										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
<u>Ducks:</u>										
Mallard										
Black										
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood	20	21	21	21	25	30	32	35	36	36
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<u>Coot:</u>										

3 -1750a

Cont. NR-1

(Rev. March 1953)

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

REFUGE Carolina Sandhills N. W. RefugeMONTHS OF May TO August, 19 60

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total
	11	12	13	14	15	16	17	18		
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard										
Black										
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood	32	35	35	35	30	30	30	30	3738	20
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:										
				(over)						

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans				Principal feeding areas <u>Ox Pen, Martins Lake, Lake Bee</u>
Geese				<u>and other small lakes.</u>
Ducks	3738	36	20	Principal nesting areas <u>Lakes on Refuge</u>
Coots				
				Reported by <u>Ernest F. Holland</u>
				Ernest F. Holland, Refuge Manager.

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

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

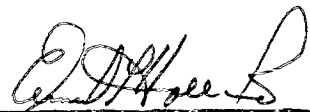
3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Carolina Sandhills N. W. Month of May to August 19 60.
Refuge

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Great Blue Heron			3	June to Aug.						8
American Egret			6	July to Aug.						10
Snowy Egret			16	June to July						24
II. <u>Shorebirds, Gulls and Terns:</u>										

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	Resident	4,000 Aug.		2000	6000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	Resident	1,000 Aug.		500	1500
Reported by 				Ernest F. Holland, Refuge Mgr.	

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)
II. Shorebirds, Gulls and Terns (Charadriiformes) & Gruiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and prodeaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

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

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Carolina Sandhills

For 12-month period ending August 31, 1960

Reported by Mr. Ernest F. Holland Title Refuge Manager.

(1) Area or Unit Designation	(2) Habitat		(3) Use-days	(4) Breeding Population	(5) Production
	Type	Acreage			
NORTHERN ZONE #1	Crops	482	Ducks	3120	3
	Upland	11638	Geese		5
	Marsh		Swans		
	Water	80	Coots		
	Total	12,200	Total		
CENTRAL ZONE #2	Crops	1143	Ducks	66560	9
	Upland	19607	Geese	113239	21
	Marsh		Swans		
	Water	150	Coots	847	
	Total	20,900	Total		
SOUTHERN ZONE #3	Crops	350	Ducks	1580	2
	Upland	11557	Geese		4
	Marsh		Swans		
	Water	10	Coots		
	Total	11917	Total		
	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		
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) Breeding
Population: An estimate of the total breeding population of each category of birds for each area or unit.
- (5) Production: Estimated total number of young raised to flight age.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Carolina Sandhills N. W. Refuge Months of May to August, 1960.

(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'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
E. Bob White	40,000(All Cover Type)	9	50	2700	45F-55M				6,000	
E. Wild Turkey	40,000(All Cover Type)	30	6	54					140	

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 Carolina Sandhills National Wildlife Refuge

Months of May thru August 194 1960

(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.
Chufas	47 Bu.		47 Bu.		47 Bu.						
Oats	30 Bu.		30 Bu.					30 Bu.	30 Bu.		
Rye	200 Bu.	315 Bu.	515 Bu.	182 Bu.			182 Bu.	333 Bu.	233 Bu.		100 Bu.*
L. Bicolor	**740 Lbs.		740 Lbs.					740 Lbs.	240 Lbs.		500 Lbs.
L. Sericea	5460 Lbs.		5460 Lbs.					5460 Lbs.	1000 Lbs.	***	4460 Lbs.
Crotalaria	1420 Lbs.	474 Lbs.	1894 Lbs.		1894 Lbs.		1894 Lbs.				
German Millet	500 Lbs.		500 Lbs.		500 Lbs.		500 Lbs.				
Brn Top Millet	100 Lbs.		100 Lbs.		100 Lbs.		100 Lbs.				
Martins Milo	100 Lbs.		100 Lbs.		100 Lbs.		100 Lbs.				
Buckwheat	336 Lbs.		336 Lbs.		336 Lbs.		336 Lbs.				
Wheat		85 Bu.	85 Bu.					85 Bu.	85 Bu.		
Cowpeas		5 Bu.	5 Bu.		5 Bu.		5 Bu.				

- (8) Indicate shipping or collection points Carolina Sandhills N. W. Refuge
- (9) Grain is stored at Refuge area
- (10) Remarks * Scheduled for pickup by Cape Romain Refuge; ** Correction from previous reports;
*** 500 lbs. of this surplus to be picked up by Santee Refuge.

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.

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REFUGE NARRATIVE REPORT
CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE

JANUARY TO APRIL 1960

GENERAL

A. WEATHER CONDITIONS:

Rainfall during January was excessive by 4 inches with temperatures near normal. February precipitation was above normal with temperatures near normal. Precipitation for March was several inches above normal. We experienced three snow storms during this month which occurred during the 1st half of the month causing very bad driving conditions. Schools in the area were closed and traffic on the roads was almost at a standstill for several days. Temperatures during March was way below normal. This was the most severe March weather in many a year. This March was a record for bad weather. April precipitation was near normal, however most of the rainfall occurred during the 1st to the 5th of the month. The remainder of April was hot and dry causing considerable forest-fire hazards. High winds were experienced during this dry spell in April in which one of our worst forest fires occurred. Temperatures were on the average above normal.

MONTH	PRECIPITATION	NORMAL	MAXIMUM TEMPERATURE	MINIMUM TEMPERATURE
JANUARY	7.46	3.26	68	22
FEBRUARY	5.96	3.25	71	21
MARCH	6.32	3.95	78	15
APRIL	3.87	3.80	93	32

B. HABITAT CONDITIONS:

1. Water:

Water levels were above normal for the entire period. Black Creek was in flood stage at least 90% of the period and floods were frequent on Lynches River. The following quote is taken from Water Resources Review, S. C. District of the U. S. Geological Survey: "Runoff in South Carolina was generally excessive during February. Discharge at key station, Lynches River at Effingham, was the highest for February and third highest for any month in 31 years of record. At the key station discharge was excessive for the 8th consecutive month. Flooding was general but no extreme floods were reported. Storage in major reservoirs increased during the month and continued well above average. Spillage occurred at several reservoirs." Note- key station Effingham is on the Lynches River 40 miles (river) below the refuge.

2. FOOD AND COVER:

Green browse of wheat, rye, oats and ryegrass was abundant until the first of March when 3 successive snows temporarily killed it back to ground level. The supply of natural foods, with the exception of acorns, was above average. Hurricane Gracie that struck our area last September 29 ruined the acorn crop, most of the acorns were immature and the high winds blew them off the trees, some were utilized by wildlife but most of them were ruined by rot. Chufas produced a good yield and some were available for wildlife most of this period. For the first time all grain grown by refuge personnel was utilized without benefit of harvest. All of the standing corn had been consumed by the end of February and supplemental feeding from storage bins was necessary to take care of Canada Geese. Upland game food patches planted to wheat, rye and ryegrass last fall was heavily used by deer and turkey. The patches planted to wheat received the best utilization, rye the least.

II WILDLIFE

A. MIGRATORY BIRDS:

1. Waterfowl:

The Canada goose population continued to increase this period and spring migration was much later than usual. The unusual cold snowy weather the first 2 weeks in March probably accounted for this. Although geese and mallards consumed all the grain planted on the Ox Pen area they still preferred to loaf in the Martins Pond area. Browse utilization in the Ox Pen area was dissappointing, most of the utilization in this area was in the immediate vicinity of the lake only. The permanent strips plantings of *Sericea Lespedeza* that was mowed and over-seeded to wheat last fall at Martins and Ox Pen produced excellent browse and was used by upland game and waterfowl.

2. Mourning Doves:

The winter population of doves was excellent and no mortality was noted. The 3 snows that came the first 2 weeks of March did not affect the refuge population, as many as a 1,000 birds were observed feeding on corn scattered for waterfowl in the Martins Pond area. The unusually cold weather in early March delayed Spring nesting but by the end of the period birds were observed over most of the refuge.

B. UPLAND GAME BIRDS: (Quail) 1.

Very few paired birds had been observed by the end of the period, many of the birds were still in coveys. The unusually late spring was responsible. No major change in population is apparent.

2. Eastern Wild Turkey:

Mixed flocks of 8 to 10 birds of gobblers and hens were observed through March but during April the turkeys began nesting and the flocks broke up. By the end of the period observations of lone hens were frequent indicating that nesting had begun. Some supplemental feeding of turkeys was done during March. The 3 snows during the first 2 weeks of March covered all the natural and planted foods, shelled and ear corn was scattered in isolated areas for turkey food, doves benefitted from this food also. No turkey nest had been located at the end of the period.

C. BIG GAME ANIMALS:

Deer are observed almost daily and they use all types of habitat throughout the refuge.

D. FUR ANIMALS, PREDATORS, RODENTS AND OTHER MAMMALS:

No major increase or decrease in population of fur bearers is apparent from signs, no censuring was undertaken.

E. HAWKS, EAGLES, OWLS, CROWS, RAVENS AND MAGPIES:

No unusual population to report.

F. OTHER BIRDS:

No unusual observations.

G. FISH:

No stocking was done this period. Fertilizing was begun on April 14, when water temperature reached 67 degree farenheight, in lakes 16, 17 and twin lakes, a second application was applied on April 26, no algae bloom was noticable at the end of the period. The cold spring weather that delayed the fertilizing and algae bloom also delayed the fishermen, - not much activity by the end of the period.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. PHYSICAL DEVELOPMENT:

7 acres was cleared of trees, stumps bulldozed out, grubs and debris picked up and double disced and prepared for planting a chufa nursery. Approximately 15 acres of scrub oak was bulldozed in the Ox Pen area, a portion of this has been piled with root rake and burned. 30 miles of truck trails was machined twice during the period. Approximately 1000 cu. yards of sand and clay was moved with front end loader and dump trucks to repair fills in Martins Pond area, Park Road, Wire Road and Truck Trail 9. The entrance road into Lake Sixteen was increased in width and straightened by bulldozing and machined.

B. PLANTINGS:1. Aquatic and Marsh Plants: None2. Trees and Shrubs:

The State Forestry Commission planted 150 acres, 150,000 trees to longleaf pine seedlings in the refuge. Planting locations were previous clearings for watermelons and old agricultural fields. Method used was machine planting in open furrows.

3. Upland Herbs: None4. Cultivated Crops:

The late spring delayed all farm activity until the latter part of April. To date we have most row crop land in Ox Pen and Martins Pond waterfowl areas ready for planting and about 20 acres of this has been planted to corn at Martins. 15 acres of crotalaria has been seeded in the Martins area and food strips. The unusual wet cold weather has delayed all of our farm operations and food patch plantings of all types will be late.

C. Collection of Receipts: NoneD. Control of Vegetation: No herbicide was applied this period.E. Fires:

Two incendiary fires occurred on the refuge and were started about daylight on the morning of January 23. Each of these fires burned 1 acre with no damage to timber or habitat. The same person or persons set a total of 8 separate fires but 6 of these were in the Sandhills Wildlife Management Area and all fires were extinguished before any damage was done.

On April 8 a farmer, Clyde Laney, was burning debris on private land west of the refuge boundary when high winds blew the fire out of control and into the refuge. The fire burned 4,405 acres of refuge land for an estimated \$26,136.00 damage.

On April 22 a lightning started fire burned 80 acres for an estimated \$456.00 damage.

IV PUBLIC RELATIONS

A. Recreational Uses:

Recreational uses were confined primarily to fishing, the usual amount of bird watchers came in to observe the waterfowl on Martins Pond. The very inclement weather during March and April cut public use of our fishing lakes to a minimum. The completion of the Black Creek Reservoir of the Carolina Power & Light Co., adjacent to the south boundary of the refuge has relieved the refuge of considerable recreational pressure. The fishing

on this new lake is best described as excellent which is the usual pattern for new impoundments in the southeast. This new reservoir will relieve the fishing pressure on the refuge for at least the next 3 or 4 years.

REFUGE VISITORS:

Mr. Horrie M. Womble, Refuge Manager, Savannah Refuge Jan. 6/60; March 11/60
 Mr. Burns - Savannah Refuge January 6, 1960
 Mr. Randolph B. Lee - Director, Sandhills State Forest 1/19; 2/1; 2/12/60
 Mr. Smith M. Canup - Predator & Rodent Control, Branch
 Mr. Charles S. Cook - General Engineer-Atlanta, Ga. 2/8; 2/9; 2/10; 2/11/60
 Mr. Mercer L. Brown - Civil Engineer - Atlanta, Ga. 2/8; 2/9; 2/10; 2/11/60
 Mr. T. B. Walters - ASC office, Clasterfield, S. C. April 12, 1960
 Mr. John McConnell - Atlanta, Ga. April 8, 1960
 Mr. (Dr.) and Mrs. Nelson - St. Catherine, Ontario, Canada 4/13/60

C. REFUGE PARTICIPATION:

Daily contact with the public was the only public relations participated in by Refuge Personnel.

SUBMITTED: May 5, 1960

APPROVED:

Lawrence L. Durren

Refuge Manager

Ernest F. Holland

Ernest F. Holland,
Refuge Manager.

W A T E R F O W L

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF January TO April, 19 60.

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling Trumpeter										
Geese:										
Canada	800	1000	1000	1000	881	881	1000	1000	1000	1000
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	450	500	500	500	150	150	100	100	100	100
Black	150	200	200	200	50	50	300	300	300	300
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood	50	50	50	50	25	25	20	20	20	20
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:	10	10	10	10	5	5	3	3	3	3

WATERFOWL
 (Continuation Sheet)

REFUGE Carolina Sandhills National Wildlife Refuge MONTHS OF January TO April, 19 60

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production :Broods:Estimated : seen : total	
	11	12	13	14	15	16	17	18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	700	250	250						75,334		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	50	8	8						19,012		
Black	150	17	17						15,638		
Gadwall											
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood									2310		
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:									434		

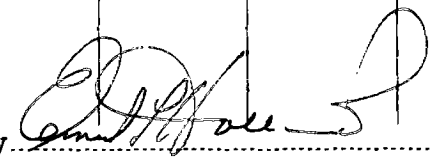
(over)

	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans			
Geese	75,334	1000	
Ducks	36,960	750	
Coots	434	10	

SUMMARY	
Principal feeding areas	Refuge lakes and ponds
Principal nesting areas (wood ducks) only	Ham Branch, Rogers Branch, Skipper Creek, Black Creek.
Reported by Ernest F. Holland, Refuge Manager.	

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

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

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons</u> : Mourning dove White-winged dove	Resident 1000				1500
IV. <u>Predaceous Birds</u> : Golden eagle Duck hawk Horned owl Magpie Raven Crow	Resident 300				300
Reported by 				Ernest F. Lottland, 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 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.

3-1752
Form NR-2
(April 1946)

LAND GAME BIRDS

1613

Refuge Carolina Sandhills Refuge Months of January to April, 19 60.

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'y'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
E. Bob-White	40,000 (All Cover)	40							1000	
E. Wild Turkey	40,000 (All Cover)	80							100	

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)

ALL MAMMALS

Refuge Carolina Sandhills

Year ending April 30, 1960.

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion	
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
								Permit Number	Trappers Share	Refuge share				
Raccoon	40,000	40			55									1000
Beaver	6500	12												550
Mink	6500	130												50
Otter	6500	130												50
Muskrat	6500	86												75
Op. Possum	40,000	200			13									200
Skunks	40,000	200			15									200
Gray Squirrel	40,000	133												300
Fox Squirrel	40,000	80												500
Gray Fox	40,000	133			40									300
Red Fox	40,000	133			27									500
Bob Cat	40,000	400			13									300

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS:

Reported by

James H. Lee

INSTRUCTIONS

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

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

REFUGE GRAIN REPORT

Refuge Carolina Sandhills National Wildlife Refuge Months of January thru April 194 1960.

(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	173 bu.	15 bu.	188 bu.	90 bu.		98 bu.	188 bu.				
Corn (Seed)		3 bu.	3 bu.		3 bu.		3 bu.				
Chufa	47 bu.		47 bu.					47 bu.	47 bu.**		
Oats	30 bu.		30 bu.					30 bu.		30 bu.	
Rye	200 bu.		200 bu.					200 bu.			200 bu.*
L. bicolor	600 lbs.	720 lbs.	1320 lbs.					1320 lbs.	120 lbs.		120 lbs.
L. Sericea	5460 lbs.		5460 lbs.					5460 lbs.	900 lbs.		4560 lbs.
Crotalaria	5820 lbs.		5820 lbs.	3600 lbs.	800 lbs.		4400 lbs.	1420 lbs.	1420 lbs.		
German Millet	100 lbs.	400 lbs.	500 lbs.					500 lbs.	500 lbs.		
Green Top Millet		100 lbs.	100 lbs.					100 lbs.	100 lbs.		
Martin's Milo		100 lbs.	100 lbs.					100 lbs.	100 lbs.		
Buckwheat	96 lbs.	240 lbs.	336 lbs.					336 lbs.	336 lbs.		

- (8) Indicate shipping or collection points. Refuge Road carters
- (9) Grain is stored at Refuge Road carters
- (10) Remarks * Scheduled to be picked up by Mattamuskeet Refuge for carp removal and browse.
** Entire amount could be used for seed and plantings here but could be transferred if necessary.

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.