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REFUGE NARRATIVE REPORT  
CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE  
SEPTEMBER TO DECEMBER 1958

GENERAL

A. WEATHER CONDITIONS:

No doubt to change the monotony of this section of the report, the weatherman gave us something new to report.

The year of 1958 was the coldest since 1901 chiefly due to the cold months of January through March.

Then on December 11 we had the deepest single snow since 1914. At 8 AM 6-8 inches had already fallen. By nightfall the total was 10-12 inches. Some of it remained until Christmas.

Precipitation and temperatures for the period are listed in the table below. The normal precipitation data was obtained from Weather Bureau reports and indicate precipitation for Cheraw, S. C. located 25 miles north of refuge headquarters.

<u>MONTH</u>	<u>PRECIPITATION</u>	<u>NORMAL</u>	<u>MAXIMUM TEMPERATURE</u>	<u>MINIMUM TEMPERATURE</u>
SEPTEMBER	1.09	4.14	94	30
OCTOBER	3.62,	2.46	91	40
NOVEMBER	.54	2.80	84	32
DECEMBER	<u>3.15</u>	<u>3.46</u>	69	9
TOTAL:	8.34	12.86		
NORMAL:	<u>12.86</u>			
DEFICIENT:	4.52		Extremes (94)	(9)

B. HABITAT CONDITIONS:

1. Water: Water levels in our ponds and lakes were maintained at the desired levels.

2. Food and Cover: Both food and cover conditions are good to excellent. Millets, buckwheat and sesame produced well. Our corn crop was excellent. It appears that we will have surplus. Our browse was a little behind schedule but was satisfactory within 10 days after the Canadas arrived. The growing of browse is a problem in these sandhills. If it is sown too early it is subject to infestation by the hessian fly and also becomes unpalatable.

The production of native foods was better than usual. The acorn crop was above average. Persimmons, poison ivy, partridge peas, various species of native grasses had an average yield. Dogwoods were below the average.

Chufas produced well sown broadcast in the food plots but did poorly in the field where they were harvested for seed. Some experimentation will be carried on this year in the production of chufas.

## II. WILDLIFE

### A. MIGRATORY BIRDS.

Five Canada Geese arrived at Martins Lake on October 6. The average date of arrival is October 7. On October 7, 75 Canadas, 3 Richardsons, 1 pintail and 3 mallards were present. One Hine Goose, (a first for this refuge) was noted on October 29 and remained for a bout a month.

Our snow goose was first observed on December 17.

The maximum number of Canadas present at any one time was 600. We also had up to 650 mallards, 100 blacks, 10 widgeon, 10 ringnecks, 10 wood-ducks.

As in previous years the Martins Lake area is preferred to the Ox Pen area.

### B. UPLAND GAME BIRDS.

The quail population appears to be static. No noticeable changes were noted from previous years.

The turkey situation does not look promising in spite of reports of large flocks having been observed. Refuge personnel who covered the refuge after the snow were able to find relatively few flocks. Those observed were generally gobblers. We know that some have left the refuge and we feel that food, cover and water are not the limiting factors. It may be the predominance of predators which is limiting our turkey population.

During the time the ground was covered with snow, grain was distributed for doves, quail and turkeys. It is not believed that the latter were seriously effected by the snow, since they were able to find food exposed. One instance was observed where they scratched down through a foot of snow to get to the chufas.

Many reports of dead doves and some of dead quail reached this office. Only several dead birds were found on the refuge. In general quail withstood the snow better than the doves. It is thought that it was not the lack of food but the cold which killed the doves.

Blackoat was one of the best foods for doves during the snow. It was not completely covered and doves fed on the exposed seeds.

## C. WILD GAME ANIMALS

The deer herd is increasing and extending its range. Some damage has been done to peach trees, cowpeas and watermelons on adverse lands. In a year or two we can expect to receive complaints regarding this.

One albino deer was observed this fall and this <sup>winter</sup> and his son observed 2 mottled deer - half white and half gray.

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

Our trapping program was delaying because of an impending court case.

All signs indicate a bumper crop of raccoons, bobcats, foxes etc.

Results to date are as follows:

9 Red foxes; 7 gray foxes; 6 bobcats; 17 raccoons; 6 opossums; 4 dogs; 1 house cat and 5 skunks.

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

No predation by eagles has been observed to date. Hawks are numerous but generally cover is sufficient to prevent excess depredation.

## F. OTHER BIRDS

None.

## G. FISH

Twin lakes and triple lakes were stocked with bream on December 10.

Fishing has been poor most of the year resulting in a decline in sales of fishing permits.

During 1958 731 daily and 187 season permits were sold with receipts totalling \$741.20.

## III. REFUGE DEVELOPMENT AND MAINTENANCE

### A. PHYSICAL DEVELOPMENT

Additional stumps were removed from the new clearing at Martins lake. Burning of brush heaps was delayed until late in December due to extreme fire conditions prior to that time.

Final approval has been given to the residence under construction here.

### B. PLANTINGS:

1. Aquatic and Marsh Plants: None
2. Trees and Shrub: None
3. Upland Herbs: None
4. Cultivated Crops:

The okra yield was very poor this year. Only 64 bushels were harvested. Corn on the other hand produced an excellent yield. An estimate of 1,000 bushels was produced.

The combination of ryegrass, buckwheat and millet sown during the first ten days of August was very poor for ryegrass and only fair for millet and buckwheat.

Yields of sericea and crotonaria were good.

A total of 100 acres were sown to browse by refuge personnel. Cooperators sowed a total of 490 acres to small grains.

### C. COLLECTION OF RECEIPTS:

None

### D. CONTROL OF VEGETATION:

None

### E. FIRES:

No fires occurred on the refuge during the year of 1936.

## IV PUBLIC RELATIONS

### A. RECREATIONAL USES:

Recreational uses are chiefly fishing and picnicing at the Lake Bee area.

### B. REFUGE VISITORS:

Mr. Randolph B. Lee - Director Sandhills State Forest-9/3; 10/22; 10/28  
 Mr. Morris M. Wamble-Refuge Mgr. Savannah Refuge-Sept. 4  
 Mr. Robert E. Lines-Branch of Realty-N. O.-Sept. 11  
 Mr. John M. Ford - Forester, N. O. Sept. 11

Mr. J. M. Martin-Olson College, Olmsted, S. C. Sept. 24  
 Mr. Mills - Cape Romain Refuge, Sept. 24  
 Mr. John Nesbit - Cape Romain Refuge, Sept. 24  
 Mr. Lawrence S. Givens - Regional Supervisor, R.O.-Oct. 9  
 Mr. Ernest F. Holland - Kentucky Woodlands Refuge-10/9; 12/2  
 Mr. Philip O. Van Dyke - Asst. Regional Supervisor-10/13; 10/14; 10/15  
 Mr. James R. Fielding - Division of Fisheries-R.O. 10/15; 10/16  
 Mr. Robert T. Webb - Fish Mgmt. Biologist-R.O. 10/15; 10/16  
 Mr. Von Hocky - State Forest, S. C. - 10/22; 10/27/58; 10/28  
 Mr. John Blots - Br. of Fish Hatcheries - 11/3/58  
 Mr. Richard E. Corthall - Br. of Realty, R. O.-11/20  
 Mr. (Prof.) Freeman USC and Students 11/23  
 Mr. Frank Nelson-S. C. Wildlife Resources Comm.-12/4  
 Mr. Eddie Pentress-Chowan Fish Cultural Station- 12/10

#### 0. REFUGEE PARTICIPATION:

The Refuge Manager gave talks about wildlife to Chowan Biology Class on October 3-75 students attended; a talk to 35 grade pupils of the West Hartsville School on October 13 and showed a film on Arbor Day to the Macon School on December 5.

**SUBMITTED: January 6, 1959**

Approved: Lawrence S. Givens  
 Regional Refuge Supervisor

JAN 14 1959

*Paul W. Sturm*  
 Paul W. Sturm,  
 Refuge Manager.

## ANNUAL HERBICIDES REPORT

1958

Four ponds each with an area of approximately two acres each were treated with herbicides. The purpose of this treatment was to determine the feasibility of reducing and possibly exterminating heavy growths of water milfoil - Myriophyllum sp; Golden Club - Oreocetes aquaticum and Floating Heart - Najas Cordatum.

We were hesitant about applying more sodium arsenite. At a later date tests by Mr. Robert Webb indicated that these ponds had practically no fish in them and that rates, up to 18 gallons per pond would have been more desirable. However had there been fish in the ponds this amount might have resulted in a depletion of the oxygen supply when the vegetation was decomposing.

Herbicide containing 20% 2,4-D by weight shows promise. No doubt better results would have been obtained had it been applied earlier in the year. Being in granular form it is easy to apply.

Funds from the sale of fishing permits were used to pay for the herbicides used.

Attached is the Herbicide Treatment table showing areas treated and the results of such treatment.

# HERBICIDE TREATMENTS

<u>AREA</u>	<u>DATE</u>	<u>CHEMICAL</u>	<u>RATE</u>	<u>RESULTS</u>
Upper Twin	7/2/58	2,4,5T (Trade name of "Kuron")	2.5 gal per surface A.	90% plus kill by 8/22. only a scattered vegetation in head of pond.
Lower Twin	7/2/58	Sodium Arsenite	1½ gal. per acre foot	80% kill in upper half of pond. About 25% kill in lower half.
	7/24/58	" "	.75 gal. per acre-foot	
Upper Triple	7/2/58	" "	1 gal. per acre-foot	20% kill
Lower Triple	8/22/58	2,4-D, ester in granular form (trade name: Granular Weed Knap-20) (Contains 20% by weight of 2,4-D)	100 # per surface acre	80% kill of Golden Club 40% kill on water milfoil



REPORT OF USE - C. & G. 1958.

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

A. Carolina Sandhills National Wildlife Refuge.

B. Estimated total use of all types 5,890 visitor-days.

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

Estimated visitor-days None

2. Fishing use.

Estimated visitor-days 3,280

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

Estimated visitor-days 2,610

C. Remarks.

January 8, 1959.

Date

Paul W. Starn  
Refuge Manager

W A T E R F O W L

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF September TO December 1953 KX

(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								225	300	300
Cackling										
Brant										
White-fronted										
Snow										
Blue									1	1
Other										
<u>Ducks:</u>										
Mallard								15	140	50
Black								2	60	10
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked								15		25
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<u>American Widgeon</u>								7		10
<u>Coot:</u>										

WATERFOWL  
 (Continuation Sheet)

REFUGE Caroline Sandhills National Wildlife Refuge MONTHS OF September TO December 1958 XIX

(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	350	350	530	300	300	300	600	600	47905		
Cackling											
Brant											
White-fronted											
Snow							1	1	14		
Blue	1	1	1						35		
Other											
Ducks:											
Mallard	100	100	300	520	520	435	500	600	38,280		
Black	25	25	50	45	45	50	100	100	5,632		
Gadwall											
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood											
Redhead											
Ring-necked	25	25	8		5	15	10	10	1242		
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
American Widgeon			10	10	10		10	10	469		
Coot:											
				2 (over)	2				28		

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	17,934	608	
Ducks	15,623	720	
Coots	28	2	

SUMMARY

Principal feeding areas ~~Marble Lake and Ox-Pen area~~

Principal nesting areas \_\_\_\_\_

Reported by Paul W. Starn

Paul W. Starn, 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 Caroline SandhillsMonths of September to December 1956

(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. <u>Water and Marsh Birds:</u>										
Great Blue Heron	1	Sept.	1	Sept. &	1	Dec.				5
American Egret	1	Sept.	1	Oct.	1	Dec.				4
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	<b>Resident</b>	<b>2900 Sept. &amp; Dec.</b>			<b>6,000</b>
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	<b>Resident</b>   <b>Resident</b>				<b>10</b>  <b>1900</b>
Reported by <i>Paul W. Sturm</i>					

#### INSTRUCTIONS

**Paul W. Sturm, Refuge Manager.**

- (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.



## 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.



3-1753  
Form NR-3  
(June 1945)

BIG GAME

Refuge Carolina Sandhills

Calendar Year 1958

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
			Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
Common Name	Cover types, total Acreage of Habitat	Number												
White-tailed deer	40,000 acres (all cover types)	100											500	

Remarks:

Reported by \_\_\_\_\_

## INSTRUCTIONS

Form NR-3 - BIG GAME

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

116000

Refuge Carolina Sandhills National Wildlife Refuge Year 1941 1942

## Botulism

## Lead Poisoning or other Disease

Period of outbreak \_\_\_\_\_

Period of heaviest losses \_\_\_\_\_

## Losses:

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

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

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

Areas affected (location and approximate acreage) \_\_\_\_\_

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

Condition of vegetation and invertebrate life \_\_\_\_\_

Remarks \_\_\_\_\_

Kind of disease \_\_\_\_\_

Species affected \_\_\_\_\_

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

Number Recovered \_\_\_\_\_

Number lost \_\_\_\_\_

Source of infection \_\_\_\_\_

Water conditions \_\_\_\_\_

Food conditions \_\_\_\_\_

Remarks ~~No diseased birds or animals observed on the refuge.~~

FISH

Refuge Carolina Sandhills Refuge

Year 1952

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	412	804					•
Small Mouth Bass	Rare	0	0					•
Bream (Bluegill & sunfish)	Common	2040	4120			3000 (600 Ea.)	Upper Twin Lower Twin Middle Triple Upper Triple Lower Triple	•
Jack (E. Pickarel)	Common	200	400					•
Warmouth Bass	Common	600	1240					•
Cat Fish	Common	800	1600					•

REMARKS:

3-1757  
Form NR-7  
(April 1946)

PLANTINGS  
(Marsh - Aquatic - Upland)

Refuge Carolina Sandhills Refuge 1958 ~~XXXXXX~~

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Plant- ing	Survival	Cause of Loss	Remarks
								No plantings done.

TOTAL ACREAGE PLANTED:

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

PLANTINGS  
(Marsh - Aquatic - Upland)

Refuge.....Year 194

Location of Area	Rate of Seeding or	Amount Planted (Acres or Yards of Seed)	Amount & Nature of Seedlings	Date of Plant- ing	Cause of Loss	Remarks
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3-1758  
Form NR-8  
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

C - Cover  
B - Browse

CULTIVATED CROPS - HAYING - GRAZING

Refuge Carolina Sandhills N.W. Refuge County Chesterfield 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	39	280 Bu.	9.5	70 Bu.	.5	5 Bu.	49	Coastal Bermuda(C)	300
Rye	139	744 Bu.	37	186 Bu.			139	Summer Bermuda(C)	10
Corn	30	500 Bu.	22	600 Bu.	28	600 Bu.	80	Ryegrass (B)	10
Groats	300	620 Bu.	90	143 Bu.	60	90 Bu.	450	Wheat (B)	47
Peas	28				**179		207	Oats (B)	11
Watermelons	170	216 Tons					170	Rye (B)	37
Cotton	25	6 Tons					25	Vetch (C)	7
Combine Milo	8.3	72 Bu.	2.7	25 Bu.			11	Clover White(B)	3
L. Sorghum			10	28 Bu.				Small grain	455
L. Bicolor**	11	80 Bu.	3	16 Bu.			14		
Millet					23	75 Bu.	23		
Buckwheat, Millet & Ryegrass					8	20 Bu.	8		
Chufas			10	64 Bu.	14	80 Bu.	24	Fallow Ag. Land	
Peanut						6	6		
L. Korean					5	Tons	5		

No. of Permittees: Agricultural Operations 9 Haying Operations        Grazing Operations 2

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle	65	585		300
				2. Other				
				1. Total Refuge Acreage Under Cultivation				1905
Hay - Wild				2. Acreage Cultivated as Service Operation				312

\* Not harvested and not allowed to mature by Deer. \*\* 170 of 179 acres planted to watermelons\*\*\* Not cleaned.

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

Months of September through December, 1958.

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Corn	100	600	700	310		100	410	290		90	200
Chufas	26	64	90			26	26	64	35		29
L. Bicolor*	8	16	24					24	24		
L. Sericea		28						28	8		20
Crotalaria	5	143	148					148	30		118
Rye	136		136	100	36		136				
Milo		24	24					24		24	
Wheat	70		70		70						
Oats		27	27		27						

(8) Indicate shipping or collection points Carolina Sandhills Refuge

(9) Grain is stored at Refuge area in bins

(10) Remarks \* Not cleaned.

\*See instructions on back.

## REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

**Report all grain in bushels.** For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.
- (6) Column 4 less column 5.
- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

Interior Duplicating Section,  
Washington 25, D.C. 84267

## HAYING AND GRAZING

Refuge Caroline Sandhills National Wildlife Refuge Year 1958.

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
G. S. Cates	C.Sand.-58	Ox Pen Branch	300 Acres	585		3/58 12/58			

Totals:

Acreage grazed 300 Animal use months 585 Total income Grazing \_\_\_\_\_

Acreage cut for hay \_\_\_\_\_ Tons of hay cut \_\_\_\_\_ Total income Haying \_\_\_\_\_

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
<del>THE STATE FORESTRY COMMISSION OF S. C. HAS ALL RIGHTS TO THE TIMBER UNDER A COOPERATIVE AGREEMENT.</del>								

Total income

Method of slash disposal

Ties

1000

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REFUGE NARRATIVE REPORT  
CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE  
MAY TO AUGUST 1958

GENERAL

A.

WEATHER CONDITIONS:

Month	Precipitation	Normal	Maximum Temperature	Minimum Temperature
May	4.60	3.32	98	46
June	7.68	3.86	101	58
July	9.46	5.40	96	60
August	1.76	5.36	98	64
Total:	23.50	17.94		
Normal:	17.94			
Overage:	5.56			

WEATHER:

There was more than ample moisture available during the Months of May, June and July. August was rather hot and dry but crops didn't suffer badly since they already passed growth in the critical state. In most areas irrigation of crops wasn't necessary this year.

B. Habitat Conditions:

1. Water: All impoundments were at full pool except Ox Pen which was lowered to permit growth of wild millet.

2. Food and Cover: More than sufficient foods were available for all types of wildlife.

Our oat and wheat plots were used by doves and quail <sup>and wild</sup> as many species of non-game birds. Later millets, buckwheat and sesame were available. Both brown-top and German millet produced good yields. Deer always find sufficient browse during the summer months.

An excellent corn crop is in prospects.

II WILDLIFE

A. Migratory Birds:

This is the period when ducks and geese are absent from the refuge with the wood ducks being the one exception. These were observed from time to time but usually only in pairs.

Doves were again abundant. During the months of May and June 148 immatures were trapped and banded. Also 169 adults were banded. One albino dove was noted at headquarters from time to time.

**B. Upland Game Birds:**

Many coveys of quail have been observed. It is believed that their survival was above average. Sufficient food and cover were available.

Since the Eastern Wild Turkey has changed its range on the area adjacent to the refuge, they are not seen very often. Reports indicate that they had a fair nesting season.

**C. Big Game Animals:**

Deer continue to be numerous. They are not seen very often but deer sign is observed very often, especially in pea patches. There is some depredation in watermelon fields.

The population trend of deer appears to be on the upgrade.

**D. Fur Animals, Predators, Rodents and other Mammals:**

Raccoon and fox signs is again increasing. The O'possum population was down considerably a year ago but they have made a good come back. In this vicinity more possum are killed on the highway than any other animal. Beaver are still numerous.

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

Of the predaceous birds, the red-tailed hawk is the most predominate during the summer. Some of them are as large as small eagles.

**F. Other Birds:**

No change.

**G. Fish:**

Fishing was poor the entire year. This resulted in a decrease in fishing pressure.

Mr. Robert T. Webb, Fish Management Biologist visited the Refuge on two occasions.

The smaller ponds - Twin and Triple Lakes - had no reproduction and are in line to be reclaimed. Lake 17 had lots of bass but no bream. Lake 16 was found to be in good condition. Little reproduction was found in Martins Lake but Lake 12 was fair for both bass and bream but is so weedy that fishing is difficult.

**H. Reptiles:**

Not applicable.



## I. Disease:

In contrast to last year when there were reports of screw worm in deer, this year no reports came in. According to information received in this office the cold winter last year has greatly retarded the screw work and no infestation has been found in either the deer population or in livestock.

## III REFUGE DEVELOPMENT AND MAINTENANCE

### A. Physical Development:

Work continued during the last month of the period on the clearing operation at Martins Lake. This work was handicapped due to excessive moisture conditions.

### B. Plantings:

Spring and Summer food plot plantings continued, especially brown top, German millet, chufas and cowpeas. Crotalaria was sown for land improvement. Acreages planted were as follows:

Millet - 23 acres  
Chufas - 14 acres  
Peas - 6 acres

Late fall plantings include a combination of millet, buckwheat, and rye grass totalling 8 acres. A pond edge was sown to Kentucky 31 fescue.

An excellent corn crop is in prospect. Stalks with 3 years and over 13 feet tall have been found. At this time it is too early to know how successful the sorghum and crotalaria crop will be.

### C. Fires:

None

### D. Construction:

For all practical purposes the residence under construction at this refuge has been completed. A few minor details remain to be worked out before final approval is given.

## IV PUBLIC RELATIONS

The refuge manager gave two talks to the Biology class at the Cheraw High School.

The following visited the refuge during the period:

Mr. J. A. Martin - Horticulturist - Clemson College May 8, 1958  
Mr. Billy Horton - Civil Engineer- Regional Office June 11 & July 17/58

Mr. Robert T. Webb - Fish Mgmt. Biologist-Reg. Office- 7/29 & 7/30/58  
 Mr. Frank Corman - Asst. U.S. Dist. Attorney-Aiken, S.C. 7/31/58  
 Mr. Robert E. Lines - Reg. Supervisor-Br. of Realty 7/31/58  
 Mr. Gordon Brown - S. C. Wildlife Resources Dept-Columbia, S.C. 8/6/58

SUBMITTED: September 5, 1958

APPROVED: *William L. Blumenthal*

*Sept. 12, 1958*

*Paul W. Sturm*  
 Paul W. Sturm,  
 Refuge Manager.



DENSE STAND OF SERRICEA



TALL CORN



Chufas, Chufas and More Chufas

W A T E R F O W L

REFUGE Caroline Sandhills N. W. Refuge

MONTHS OF May TO August 1954, 1954

(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	20	20	20	20	20	20	20	20	20
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<u>Coot:</u>										

WATERFOWL

REFUGE Caroline Sandhills National Wildlife Refuge (Continuation Sheet) MONTHS OF Aug TO August 1954

(1) Species	(2) Weeks of reporting period								Est. W/Touls: days use	Production : Brood: Est. : Seen :
	1	2	3	4	5	6	7	8		
<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								25	175	0 : 0
Cinnamon teal										
Shoveler										
Wood	20	20	20	20	20	20	20	20	2520	0 : 25
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<u>Coot:</u>										

(5)  
Total Day Use

(6)  
Peak Number

(7)  
Total Production

SUMMARY

Geese:

Ducks:

Goats:

2695

25

Principal feeding areas: Martins Lake and  
Ox Pen area.

Principal nesting areas: Refuge lake and  
branches.

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

3-1751

Form NR-1A

(Nov. 1945)

## MIGRATORY BIRDS

(other than waterfowl)

Refuge Caroline Smith's RefugeMonths of May to August 1954 195

(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. <u>Water and Marsh Birds:</u>										
Great Blue Heron			3	July to Aug.						10
American Egret			8	"						10
Snowy Egret			15	June & July						20
II. <u>Shorebirds, Gulls and Terns:</u>										

(over)

(1)	(2)	(3)	(4)	(5)	(6)
<b>III. Doves and Pigeons:</b> Mourning dove White-winged dove	<b>Resident</b>	<b>9000</b>	<b>Aug.</b>		<b>1900</b> <b>6000</b>
<b>IV. Predaceous Birds:</b> Golden eagle Duck hawk Horned owl Magpie Raven Crow	<b>Resident</b>	<b>1000</b>	<b>Aug.</b>		<b>1500</b>
Reported by <u>Paul W. Sturm</u>				<b>Paul W. Sturm, Refuge Manager.</b>	

#### INSTRUCTIONS

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



UPLAND GAME BIRDS

Refuge Canadian Sandhills N. W. Refuge Months of May to August 1956, XXXX

(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.
<b>H. Bob White</b>	<b>40,000</b> <b>(All Cover Types)</b>	<b>10</b>	<b>30</b>	<b>3000</b>					<b>4000</b>	
<b>H. Wild Turkey</b>	<b>*</b>	<b>40</b>	<b>3</b>	<b>45</b>					<b>200</b>	

## 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 1948.

(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	200		200			100	100	100		100	
Glufos	46		46		20		20	36		36	
L. Broom	12		12		4		4	8 *		8	
Castoraria	33		33		10		10	23		23	
Brown Top Millet	6	8	14		13		13	1	1		
Jap Millet	2		2		2		2				
German Millet	2		2		2		2				
Seed Corn	3		3		3		3				
Feenite	3		3			3	3				
Eye		186	186	30				136	86		5000
Eye Grass		4	4		4		4				
Buckwheat		4	4		4		4				
Fescue Ry St		4	4		4		4				
Milo		2	2		2		2				
Wheat		70	70					70	70		

- (8) Indicate shipping or collection points Carolina Sandhills Refuge
- (9) Grain is stored at Refuge area in line
- (10) Remarks \* Unshelled, uncleaned and unseparated; \*\* For Cape Feara 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.

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

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Carolina Sandhills Refuge For 12-month period ending August 31, 1958

Reported by Mr. Paul E. Starn Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat			(3) Use-days	(4) Breeding Population	(5) Production
	Type	Acreage				
Northern Zone #1	Crops	182	Ducks	2500		
	Upland	11638	Geese			
	Marsh		Swans			
	Water	80	Coots			
	Total	11820	Total	2500		
-----						
Central Zone #2	Crops	1143	Ducks	70,384	10	35
	Upland	19607	Geese	81,741		
	Marsh		Swans			
	Water	150	Coots	133		
	Total	20800	Total	152,258	10	35
-----						
Southern Zone #3	Crops	150	Ducks	1200		
	Upland	11357	Geese			
	Marsh		Swans			
	Water	10	Coots			
	Total	11517	Total	1200		
-----						
	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.

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REFUGE NARRATIVE REPORT  
CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE  
JANUARY TO APRIL 1958

GENERAL

A.

WEATHER CONDITIONS:

<u>MONTH</u>	<u>PRECIPITATION</u>	<u>MAXIMUM TEMPERATURE</u>	<u>MINIMUM TEMPERATURE</u>
January	6.30	64(12th)	14(5th)
February	4.42	74(23 & 24th)	8(17 & 18)
March	4.72	72(1st)	30(17th)
April	7.30	90(24 & 25th)	38(8th)
TOTAL:	22.74		
Normal:	14.28		
Above Normal:	8.46		

Previous years may have recorded lower extremes in temperature but this winter has been one of the most consistently coldest on record. Rainfall also was heavy. April 1957 was one of the driest on record. In contrast this April had more than the average amount of rainfall.

The precipitation and maximum and minimum temperatures for the period are listed above.

B. HABITAT CONDITIONS:

1. WATER: All ponds had a heavy flow of water, so much in fact that fertilization was practically useless.

We believe that ground moisture is now at and above normal level. The water table had been at an all time low.

2. FOOD AND COVER: We entered the year with more browse areas than in any previous year. They were used by deer, geese and wild turkey. Geese prefer wheat browse. Rye and vetch were used by geese to a very limited extent. Corn was available for waterfowl. Turkey did not frequent corn fields to any great extent but deer would visit them daily. Corn received from Cooperative Farmers was distributed near Ox Pen Pond and Martins Lake.

Two small corn fields not immediately adjacent to the ponds were not used by waterfowl. Several ducks and geese were placed in a pen in one of the fields but they failed to entice the birds.

Wild turkey found considerable oak mast in some areas of the refuge.



Chufas, buckwheat, cowpeas and native grasses and legumes provided food for doves and quail and other wildlife.

## XI WILDLIFE

### A. MIGRATORY BIRDS:

DUCKS AND GEESSE: It is evident that geese need additional education. We were not able to entice them into wheat browse and cornfields that were not adjacent to Ox Pen Pond.

Our Snow Goose departed before the Canadas but his early March departure was never the less late for one of its species.

Forty-eight Canada Geese were released at Ox Pen. These geese had been trapped at Mattamuskeet. One half were released as free-flyers, the other half were released with their primaries pulled from one wing.

No disease was evident but we lost some decoys as a result of predation by Golden Eagles.

Ducks were not as numerous <sup>as</sup> during the preceding year.

DOVES: This migratory bird is not nearly as abundant as in previous years. The cause for the decrease has not been determined. No dead or diseased birds have been observed.

Dove trapping operations will begin May 1.

### B. UPLAND GAME BIRDS:

We believe that survival of quail was satisfactory this winter. One bobwhite sounded off as early as January 15, but everything was quiet from that time until the latter part of April.

EASTERN WILD TURKEY: Wild turkey have been observed but except for a few exceptions they have seldom been seen in the Martins Lake area.

On one occasion the <sup>writer</sup> saw 29 and one of the laborers estimated a flock of over 30 birds.

One hen was observed with more than 15 poults but no doubt this group must have consisted of 2 flocks.

One case of a hunter killing three turkeys was reported but since they do not remain on the refuge, it was done on either private lands or lands leased to the State Forestry Commission.

### C. BIG GAME ANIMALS:

Deer are observed occasionally. Numerous deer sign is <sup>in</sup> evidence that their

numbers are increasing.

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

Beaver are still numerous and on the increase and are extending their range.

Red foxes are getting out of hand. Only a few years ago greys predominated but now there are more reds. More bobcat activity and a greater number were caught this year than last.

O'Possums which were scarce a year ago or more are plentiful this year. In this area at this time of the year more o'possums are killed on the highways than any other animal.

#### E. HAWKS, EAGLES ETC.:

Golden Eagles have given us a problem. They hang around our decoy goose pens and killed several geese.

#### F. OTHER BIRDS:

The occurrence of a snow goose was of special interest this year. A brewer's blackbird was also observed.

#### G. FISH:

Fishing got off to a poor start this Spring because of the cold wet weather.

No record breaking fish were caught thus far. Bedding was several weeks later than usual.

Lake 16 has such a tremendous flow of water that fertilisation was not considered wise. Lake 17 had more water flowing through in than in previous years but we started to fertilize it early in March.

With the exception of Lake 16, Ox Pen and Martins Lake all ponds and lakes are open to fishing on a year-round basis. Since Lake 16 has practically no waterfowl usage, consideration should be given to opening it on an all-year basis to fishing also.

### XII REFUGE DEVELOPMENT AND MAINTENANCE

#### A. PHYSICAL DEVELOPMENT:

Martins Lake clearing continued but slowly. The rains were so frequent that the soil appears to be well saturated. In many areas including the clearing operation, heavy equipment could be used only with difficulty.

Windows were repaired to several buildings. Badly rusted and corroded water pipes were replaced.

Trucks and tractors were checked to insure ease quick free and proper operation.

A new Ford pickup was received to replace the 1952 Ford pickup.

Roads were maintained and bridges and culverts repaired.

### B. PLANTINGS:

Cultivated Crops: Weather conditions caused <sup>a</sup> delay in our food plot planting operations. The following plantings have been made: Buckwheat, brown top-millet, crotonaria and corn.

A small experimental plot of alfalfa at Ox Pen is badly infested with alfalfa weevils. An attempt will be made to control same with insecticide.

Several Cooperators were eliminated because of their poor management of their programs.

### C. FIRES:

One fire burning about 10 acres occurred on the refuge. This was the first fire in two years.

### D. CONSTRUCTION:

Little progress was made in a residence being constructed at the headquarters area. At this writing the brick masons have started laying bricks and concrete blocks.

## IV PUBLIC RELATIONS

The Refuge Manager participated in a various number of activities dealing with the public. Among them were: Touring the refuge with the Biology Department of the Clemson College; giving a talk to the 8th grade pupils of the Hartsville Schools with over 60 pupils attending; talks to the North and West Hartsville High Schools; assisted the Prestwood Lake Wildlife Refuge at Hartsville; conducted visitors on several occasions to interesting places over the refuge; showed "This Magic Land" wildlife film to the McBes and Hartsville schools.

The Refuge Clerk Mark A. Brown contacted Mr. and Mrs. Kisall of Philadelphia, Pa. over the Refuge. The Kisall's were interested in bird watching. Also as Cub Master of local Boy Scouts he conducted Pack 651 over a sightseeing trip and stopped at several places for oral outlining the historical and wildlife significance of each.

### REFUGE VISITORS:

Mr. H. Freeman - University of S. C. - January 1 & February 5  
 Mr. Yarborough - S. C. Game Warden - January 7  
 Mr. W. Lehman - U. S. Game Management Agent - January 7  
 Mr. William Andrews - Internal Revenue Service - January 7  
 Mr. Albert Seegars - Hartsville, S. C. - January 7  
 Mr. Lawrence S. Givens - Regional Supervisor - January 9  
 Mr. Francis G. Gillette - Asst. Regional Director, Div. of Wildlife 1/9 and Apr. 2  
 Mr. Robert H. Coleman - College of Charleston - January 12  
 Mr. C. W. Riley - Kirkley Dunlap - Prestwood Lake W/Life Refuge - January 14  
 Mr. George Verrill - U. S. FWS - Civil Engineer - January 29

Mr. E. B. Earle - McBee Schools- February 3  
Mr. J. H. Martin - Clemson College - February 5  
Mr. and Mrs. Gerald F. Baker- Santee Wildlife Refuge-March 20  
Mr. Mellinger - Savannah Refuge - April 2  
Mr. Davis - U. S. Game Management Agent - April 2  
Mr. Phil Van Dyke - Asst. Regional Supervisor - April 24 & 25  
Mr. H. L. Holbrook - Project Leader - Francis Marion Forest - April 28

SUBMITTED: May 6, 1958

Approved: \_\_\_\_\_

*Lawrence S. Linn*

Regional Refuge Supervisor T-1 4 1958

Paul W. Sturm,  
Refuge Manager.

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

WATERFOWL  
 (Continuation Sheet)

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF January TO April, 19 58

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods:Estimated seen : total
	: 3/13 : 3/20 : 3/27 : 4/3 : 4/10 : 4/17 : 4/24 : 4/30	: 11	: 12	: 13	: 14	: 15	: 16	: 17	: 18	
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	300	400	50							43,400
Cackling										
Brant										
White-fronted										
Snow										42
Blue										
Other										
Ducks:										
Mallard										23,120
Black			30							3,815
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal						2				14
Cinnamon teal										
Shoveler										
Wood										70
Redhead										
Ring-necked										805
Canvasback										
Scaup										
Goldeneye										
Bufflehead										56
Ruddy										
Other										
Coot:										

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	:	:	:	Principal feeding areas _____
Geese	:	:	:	_____
Ducks	:	:	:	Principal nesting areas _____
Coots	:	:	:	_____
				Reported by _____

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

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

WATERFOWL  
 (Continuation Sheet)

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF January TO April, 19 58

(1) Species	(2) Weeks of reporting period								(3) Estimated Production waterfowl broods days has been seen		(4) Estimated Total
	1	2	3	4	5	6	7	8	9	10	11
Swans:											
Whistling	1/4	1/11	1/15	1/25	2/1	2/25	2/15	2/22	9	(3/1)	10 (3/6)
Trumpeter											
Geese:											
Canada											
Cackling	550	600	600	700	500	500	500	700	700		200
Brant											
White-fronted											
Snow			1	1	1	1	2	1			
Blue											
Other											
Ducks:											
Mallard											
Black	700	500	500	800	450	100	100	95	100		
Gadwall	150	80	80	130	30			5			
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood	10										
Redhead											
Ring-necked	25	20	20	50							
Canvasback											
Scaup											
Goldeneye											
Bufflehead			4	4							
Ruddy											
Other											
Coot:											

(over)

	(5)	(6)	(7)	
	Total Days Use	Peak Number	Total Production	SUMMARY
Swans				Principal feeding areas
Geese				
Ducks				Principal nesting areas
Coots				
				Reported by

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 SandhillsMonths of January to April 1958.

(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. <u>Water and Marsh Birds:</u>										
Pied-billed Grebe			15	Jan. Apr.	1	4/15				15
Great Blue Heron			1	Apr.						1
Wilson's Snipe			10	Jan. Apr.						
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	15000				2000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow		3 10 500			3 10 1500
Reported by.....					

#### INSTRUCTIONS

Paul W. Sturm, Refuge Manager.

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

Refuge Carolina Sandhills Refuge Months of January to April, ~~1971~~ <sup>1972</sup>

(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 acres (all cover type)	27							1500	
E. Wild Turkey	40,000 acres (all cover type)	47	2	15					85	15 poult were observed with one hen but there are believed to be from two broods.

## 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 Carolina Sandhills Refuge

Year ending April 30, 1958

(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				
Raccoons	40,000	34			48									1300
Beaver	6500	108												600
Mink	6500	217												30
Otter	6500	130												30
Muskrat	6500	130												30
O'Possum	40,000	133			23									300
Skunk	40,000	200			9									200
Gray Squirrel	40,000	133												300
Fox Squirrel	40,000	500												300
Gray Fox	40,000	133			19									300
Red Fox	40,000	67			70									600
Bob Cat	40,000	400			20									100

\* List removals by Predator Animal Hunter

\* List removals by Predator Animal Hunter

REMARKS:

Reported by

Paul W. Starn, Refuge Manager.

## INSTRUCTIONS

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

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

3-1570  
NR-8a

REFUGE GRAIN REPORT

Refuge Caroline Sandhills National Wildlife Refuge

Months of January thru April 1958

(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	325 Bu.	15	340	24		116	140	200		200	
L. Sorghum	16	11	27	20	7		27				
Chufas	100		100	54			54	46	10		36
L. Milor	15	1	16		4		4	12	12		
Crotalaria	99	5	104	35	36		71	33	8		25
Br. Top Millet		6	6		6		6	6	6		
Jap Millet		2	2					2	2		
German Millet		2	2					2	2		
Buckwheat		2	2		2		2				
Bahia Grass		2	2		2		2				
Seed Corn:											
B. G. 27		2	2		1		1	1	1		
Dixie 12		1	1		1		1				
Ocher 211		1	1		1		1				
Peasants	3		3					3	3		

(8) Indicate shipping or collection points

Caroline Sandhills Refuge

(9) Grain is stored at

Refuge area in bins

(10) Remarks

## REFUGEE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)--55 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.