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REFUGE NARRATIVE REPORT
 CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE
 SEPTEMBER TO DECEMBER 1961

GENERAL

A. WEATHER CONDITIONS:

MONTH	PRECIPITATION	NORMAL	MAXIMUM TEMPERATURE	MINIMUM TEMPERATURE
SEPTEMBER	2.33	4.14	97	46
OCTOBER	.93	2.46	86	32
NOVEMBER	2.05	2.80	88	25
DECEMBER	4.03	3.46	74	21
TOTAL:	<u>9.34</u>	<u>12.86</u>		
NORMAL:	<u>12.86</u>			
DEFICIENCY:	3.52		Extremes (97)Sept.	(21) Dec.

Extreme drought conditions existed during the months of September and October. Rainfall during these two months was 3.34 inches deficient in rainfall. November rainfall was below normal but scattered rainfall during November relieved the drought conditions somewhat, during December rainfall was above normal.

B. HABITAT CONDITIONS:

1. Water. With the exception of Little Martins Pond water levels on all the lakes were maintained at the recommended levels for the period. The severe drought of September, October and November was broken on Thanksgiving day, November 23, with 1.35 inches of rain which brought the water level up to the recommended level on Little Martins Pond which is the only refuge lake dependent on rainfall runoff.

2. Food and Cover. Longleaf pine produced an excellent mast crop this period and doves fed almost exclusively on the seed during its availability. Turkey oaks produced very little food but the bottom-land specie of oaks furnished a normal amount of acorns. Native wild muscadine grapes and persimmon produced bumper yields of fruit, both of which were eagerly taken by deer and other upland wildlife. Lespedeza bicolor planted in strips and patches throughout the refuge produced a good seed crop and excellent cover. Food patches planted to millet, cowpeas, buckwheat, soybeans, chufas, corn, wheat, rye and milo has supplied sufficient supplement to the natural foods. Both food and cover conditions will be improved with the adaption of a good silviculture plan which appears to be in the making.

II WILDLIFE

A. Migratory Birds: The first Canada goose arrivals was recorded on September 23 when 9 Canadas was seen at Martins Pond, this number increased to 42 the following week. The goose population buildup was normal until the week of October 22 when the refuge population leveled off with 500 birds which remained fairly constant with 500 to 600 birds until December 3 when the total reached 700, at the end of the period we had 900 geese using the Martins Pond and Ox Pen areas which is 100 less than the peak for the same period last year.

The duck population has been disappointing so far this season. At the end of the period we had a total of 875 ducks of all specie using the refuge, 700 of these were mallards. At the end of the period a year ago we had a total of 2,050 ducks, 1,700 of these were mallards.

Both ducks and geese use the Ox Pen and Martins Pond area. Waterfowl use on either area may be increased or decreased by crop manipulation. The series of beaver pools between Lake 12 and Martins Pond provides the largest marsh area in the refuge and is used by mallards and wood ducks for loafing and roosting.

The refuge dove population for the period has followed the usual pattern, an abundance of birds in September and October but tapering off with the arrival of cold weather later in the period.

Cereal grains such as corn, buckwheat, milo and millet and green browse of rye, wheat and ryegrass has furnished adequate food for all wildlife this period.

B. Upland Game Birds: Sight records of wild turkey indicates a slight decline in population density, also a shift in fall range is noticeable. This shift was probably caused by disturbance from hound dogs used for "deer driving" on the Hows and Seegars tracts, private holdings within the administrative boundary of the refuge. The area affected by the dog menace is the Ham Branch watershed which is our best turkey habitat and is intensively developed with game food patches and clearings. Food is adequate for the present turkey population but both food and cover would be improved with a good TSI and prescribed burning program.

The Bobwhite quail population remains fairly constant. Sight records indicate that winter coveys are average in size. Distribution is limited to "edge" primarily edges of agricultural areas. This popular game bird would probably benefit most from the TSI and prescribed burning program mentioned above. Food is adequate, cover too heavy, particularly for any profitable harvest from public hunting.

C. Big Game Animals: The Sandhills deer herd continues to increase. The distribution is excellent, even into the high dry scrub oak ridges north of Catarrh Road. The extensive development of the Ox Pen Waterfowl Area and refuge protection of the vicinity accounts for the extended distribution. The legal deer season began here on September 15 and closed

on January 1, bucks only, 2 per day, 5 per season. There was considerable hunting pressure on deer this season and deer drives with hound dogs was an "every day occurrence" on several private tracts within the refuge and on a large portion of the adjacent private lands. The South Carolina "bucks only" law is beginning to have its effects on the refuge herd, bucks with trophy size heads are becoming scarce. Good law enforcement adjacent to the refuge protects a fairly high average of does, a much higher average than the State as a whole where enforcement as a rule is less intense. Some control through public hunting should be initiated during 1962, however the state "bucks only" law should be amended to include either sex for refuge hunting to give positive control of the herd.

D. Fur Animals, Predators, Rodents, and other Mammals. No appreciable increase is apparent in any of these mammals. Due to a shortage of personnel no predator trapping was done during the period. It is hoped that Refuge Aid Rogers will be able to run the predator control trap line for at least 4 weeks of the next period. In the past our predator control program has removed the annual increment of predators consequently lowering the predator pressure on turkey and other upland game.

E. Hawks, Eagles, Owls, Crows, Ravens, and Magpies: By the end of the period the usual numbers of migrating marsh hawks had arrived and all desirable habitat for food hunting had been taken. Other than crows none of the above birds do any destructive predation in the area. Crows continue to bother local farmers with their predation on corn, watermelons and pecans. One local farmer has installed 3 acetylene guns in his pecan orchard, the guns kept the crows out but when first installed brought the local warden and refuge^{men} "on the double" looking for the dove hunters shooting before noon.

Only 1 bald eagle has been observed on the refuge this period and its visit was short-lived, only 2 observations were made.

F. Other Birds. Nothing to report under this item.

G. Fish: Management of Lake 16, Lake 17, Twin Lakes and Triple Lakes for fishing was continued. Management consisted of fertilization with "Hydropak" water soluble fertilizer to produce and keep a "bloom" of algae for insect food and periodic treatments of "weed rhap-20" low volatile granular 2,4-D ester for the control of water weeds. Periodic checks with fishermen using the refuge lakes disclosed the fact that fishing success was below previous averages for refuge waters, cause of failure is unknown.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development. Approximately 5 acres of new clearing was done on Ham Branch for a dual purpose, to extend an old clearing into the marsh to encourage waterfowl use and to provide new land for a chufa nursery planting for the spring of 1962. Heavy summer rains caused erosion to all truck trails, most of these were machined at least once during the period

with diversion ditches and outlets reopened. Approximately 10 miles of food strip plantings of *Lespedeza bicolor* was mowed and encroachments of pine and hardwoods were removed by bulldozer. One standard headquarters recognition sign for Wappanoca Refuge was constructed during the period. Several small bridges were redecked and repaired. One culvert on Park Road near Ox Pen Branch was repaired and fill replaced. Our headquarters recognition sign, erected in 1950, was taken down and refinished and rehung on new pressure treated timbers. The Minneapolis-Moline farm tractor engine and hydraulic system was overhauled. The engine in the Ford stake truck was replaced with a rebuilt one during the period. Considerable funds and man-hours were expended on regular maintenance of buildings, grounds, fences, vehicles, tractors and allied equipment.

B. Plantings:

1. Aquatic and marsh plants: None

2. Trees and shrubs: None

3. Upland herbs: None

4. Cultivated crops: All the summer maturing crops did well. Corn planted for waterfowl and upland game produced above average sandhill yields. All of the milo plantings were disappointing, seed used were the hybrid strain recommended for this area but the yield was disappointing, in some fields the yield was zero. Some experimenting will be done with milo in the future, the old open pollinating variety of Martin's early combine milo has produced fair yields here in the past and if a source of that seed can be found we intend to experiment with it next year. Buckwheat suffered from fall drought but did produce some food. Soybeans and cowpeas did well where the deer did not over browse them. Cowpeas planted in rows for harvest received considerable damage from deer but did produce enough mature seed for next years refuge plantings. The prolonged drought of September and October damaged our green browse plantings of small grain, most of the browse plantings in the waterfowl areas were planted twice and poor stands still existed, however sufficient green food was available for geese by virtue of the large acreage planted. The Dixie Pipeline Right-of-way was disced, fertilized and planted to oats and rye in late October and has produced excellent browse for deer, turkey and other upland game. The chufa plantings for seed harvest was almost a total failure, yield was too low to attempt harvest. The field was lightly disced and what chufas were available are being harvested by turkey. We have no explanation of the crop failure unless it was excess rainfall during June and July.

C. Collection and Receipts: None

D. Control of Vegetation: See attached sheet on herbicide treatments.

E. Planned Burnings: None

F. Fires: None

IV PUBLIC RELATIONS

A. Recreational Uses: Public fishing in the refuge was closed on November 30 and after that date bird watching was the only recreational use utilized by the public.

B. Refuge Visitors:

Mr. James J. Turner - NPS Recreational Survey, Richmond, Va. 9/13/61
 Mr. Gustaf P. Hultman - NPS Recreational Survey, Richmond, Va. 9/13/61
 Mr. E. C. Pickens - S.C. Forestry Commission, Columbia, S. C. 9/13/61; 9/28/61
 Mr. E. W. Fentress - U. S. Fish Hatchery, Cheraw, S. C. 9/18/61
 Mr. R. E. Lines - Regional Supervisor, Br. of Realty, Atlanta, Ga. 9/28/61
 Mr. L. S. Givens - Regional Supervisor, Br. of Refuges, Atlanta, Ga. 9/28/61
 Mr. C. H. Flory - S. C. Forestry Commission, Columbia, S. C. 9/28/61
 Mr. H. R. Scott - S. C. Forestry Commission, Columbia, S. C. 9/28; 11/21; 12/12
 Mr. R. B. Lee - Director, Sandhills State Forest, Patrick, S.C. 9/28/61
 Mr. Leb Palmer - U. S. Forest Service, Columbia, S. C. 10/3/61
 Mr. Verlon Carter - Regional Forester, Atlanta, Ga. 10/10/61; 12/12/61
 Mr. Russell L. Tyre - Forester, Piedmont Refuge, Ga. 10/26/61; 12/12/61
 Mr. W. R. Jones - S. C. Wildlife Res. Commission, Chesterfield, S.C. 10/30; 12/29
 Mr. D. R. Ambrsen - Back Bay Refuge, Virginia 11/3/61
 Mr. C. Crosby Rice - S. C. Forestry Commission, Columbia, S.C. 11/21/61
 Mr. Harlan McLees - S. C. Forestry Commission, Columbia, S. C. 12/12/61
 Mr. James D. Almond - Savannah Refuge, Ga. 12/18/61; 12/27/61
 Mr. J. Clyde Quick - S. C. Wildlife Res. Commission, Columbia, S.C. 12/29/61
 Mr. R. G. Newton - S. C. Wildlife Res. Commission, Columbia, S. C. 12/29/61

C. Refuge Participation: No special meetings were attended by refuge personnel.

D. Violations: None to report for the period.

E. Safety: Four safety meetings were held during this period. No accidents occurred on the refuge during this period. Significant measures taken to correct or prevent hazardous conditions were: brush and debris along refuge trails and curves were removed; the walk-way on Ox Pen was repaired; belt and power take off guards were replaced on the rotary-mower and worn out parts removed; new hose was obtained to replace worn out hose for gas tanks and drums; welding and cutting outfit purchased to replace old worn out one in shop; small units of oxygen inhalant purchased for our first aid kit; fire extinguishers were checked. Record to date of accident free days as of December 31, 1961: 485 days. Total number of hours worked by all employees since last lost time accident: 17,086 hours.

V. OTHER ITEMS

Mr. Bemie G. Lundy, assistant refuge manager at Sandhills since February 1957 was promoted and transferred to Roanoke Refuge on November 29. No replacement for Mr. Lundy had been appointed at the end of the period.

However a new position of Forester has been established to assist in the coordination of forestry and wildlife activities between the refuge and the Carolina Sandhills Wildlife Management Area which is managed by the South Carolina Forestry Commission. Finally after 23 years of negotiation the Service and the South Carolina Forestry Commission has agreed upon a wildlife management plan for the operation of the adjoining Carolina Sandhills Wildlife Management Area and the State is now putting the plan into operation, real progress. The construction of the 8 inch liquid petroleum gas pipeline through the refuge and management area that began in August was finished in October. The 50 Ft. wide right-of-way was cleared of all timber and stumps, double disced with heavy disc plows, treated with 1 ton of pulverized basic slag per acre, fertilized with 400 lbs. of 5-10-10 commercial fertilizer per acre and seeded with rye and oats in late October. The seeded right-of-way has produced excellent browse and wildlife use has been heavy particularly deer and turkey. The right-of-way will be re-fertilized with 500 lbs. of 5-10-10 fertilizer and seeded to St. Augustine Bahai grass and Ispedaza sericea in the early spring. The right-of-way traverses the refuge from west to east and comprises approximately 11 miles of 50 ft. clearings through Government land. Original seeding and annual maintenance by mowing is the responsibility of the Dixie Pipeline Company. Wildlife Aid Eagers banded 50 hood ducks in September and October. With the present heavy population of beaver at Sandhills it is almost impossible to trap any waterfowl, any baiting dove in the water or on the shore will attract beaver and we have not been able to devise any method that will keep the beavers out of the traps.

B. Photographs: Nine photographs of refuge activities were taken during this period, photographs are attached.

SUBMITTED: January 24, 1962.

APPROVED:

Victor H. Key
Acting Regional Director
 Jan. 25, 1962

Ernest F. Holland
 ERNEST F. HOLLAND,
 Refuge Manager.



Headquarters entrance sign after refinishing.



Mowing corn for waterfowl food at Martins Pond area.



Mowed corn field - Ox Pen Lake in background.



Dixie Pipeline R/W after seeding - See Photo #11 in last report.



Pipeline R/W after seeding, looking east from TT8, see Photo #12 in last report.



Pipeline R/W after seeding, looking west from TT 8.



Canada geese resting on Martins Pond.

HERBICIDE TREATMENTS

YEAR 1961

PRINCIPAL SPECIES UNDER CONTROL:

Red Maple (*Acer rubrum* L.); Hackberry (*Celtis*, L.); Sweet Gum (*Liquidambar styraciflua* L.); Yellow Poplar (*Liriodendron tulipifera* L.); Alder (*Alnus rugosa*); Bull Bay (*Magnolia* L.); Gall Berry (*Ilex glabra*); Sallax (*Sallax laurifolia* & *sallax walteri*); Cherry (*Prunus serotina*); Sumac (*Rhus glabra* L. & *Toxicodendron*); Persimmon (*Diospyros virginiana* L.); Muscadines (*Vitis* L.); Willow (*Salix nigra*); Blackberry (*Rubus* L.); Huckleberry (*Gaylussacia*); Blueberry (*Vaccinium* L.); Greenbrier (*Saillacoeae*); Black gum (*Nyssa* L.).

AGE AND AREA OF TREATMENT:
TYPE OF EQUIPMENT USED:

15.5 acres located at the Ox Pen Branch, Carolina Sandhills National Wildlife Refuge. Pressure pump mounted on Jeep.

DATES OF TREATMENT GROWTH STAGE

CHEMICAL USED RATE OF APPLICATION RESULTS

#1	June 8	Full-leaf	2,4,D Ester(LV)	6 lbs. per 100 Gals.	Rain fell after treatment from immediately after until as high as 24 hours after treatment.
#1	June 9	Full-leaf	2,4,5-T LV	N20 - per acre	
#1	June 12	Full-leaf	Isopropyl Ester	"	Stage of development: Mature and immature.
#1	June 13	Full-leaf	"	"	
#1	June 14	Full-leaf	"	"	
#1	June 15	Full-leaf	"	"	Cost of #1 treatment: Materials: \$104.63; Labor: \$125.00; Equipment: \$4.80. Total cost: \$234.63
#1	June 19	Full-leaf	"	"	Temperatures from: 80 degrees to 95 degrees. Sandy loam-acid soils.
#1	June 20	Full-leaf	"	"	
#1	June 21	Full-leaf	"	"	
#1	June 23	Full-leaf	"	"	
#2	July 11	Full-leaf	"	"	No rain following this treatment. Final kill 95% kill. A higher percentage of kill resulted where there was no rain following treatment.
#2	July 13	Full-leaf	"	"	Cost of Treatment #2: Labor: \$32.50; Materials: \$40.50; Equipment: \$2.50; Total Cost: \$75.50

Cost of both treatments: \$310.13

A follow up program will be carried on next year until total kill is in evidence.

W A T E R F O W L

REFUGE Carolina Sandhills National Wildlife

MONTHS OF September TO December, 1961.

(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			9	42	121	300	400	500	500	500
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
<u>Ducks:</u>										
Mallard							75	75	75	75
Black							25	25	103	103
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal			10	10	10					
Cinnamon teal										
Shoveler										
Wood			50	50	50	50	50	50	50	50
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<u>Coot:</u>										

3 -1750a

Cont. NR-1
(Rev. March 1953)WATERFOWL
(Continuation Sheet)REFUGE Carolina Sandhills National WildlifeMONTHS OF September TO December, 19 61

(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	600	600	600	700	700	900	900	900	57,904		
Cackling Brant White-fronted Snow Blue Other											
Ducks:											
Mallard	75	75	225	300	300	375	700	700	21,350		
Black	103	103	75	100	100	125	125	125	7,784		
Gadwall Baldpate Pintail Green-winged teal Blue-winged teal Cinnamon teal Shoveler											
Wood	50	50	50	50	50	50	50	50	5600		12
Redhead Ring-necked Canvasback Scaup Goldeneye Bufflehead Ruddy Other											
						100			700		
Coot:											

(over)

	(5)	(6)	(7)
	<u>Total Days Use</u>	<u>Peak Number</u>	<u>Total Production</u>
Swans			
Geese	57,904	900	
Ducks	35,994	875	12
Coots			

SUMMARY

Principal feeding areas Ox Pen Lake, Martine Lake
developments.

Principal nesting areas (Wood Ducks) only Ham Branch,
Rogers branch, Skipper Creek, Black Creek.

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

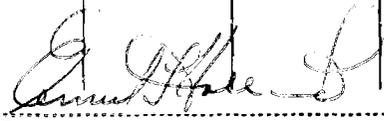
Form NR-1A
(Nov. 1945)MIGRATORY BIRDS
(other than waterfowl)Refuge Carolina Sandhills National Months of September to December ~~195~~ 1961.
Wildlife

(1) Species	(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
<u>I. Water and Marsh Birds:</u>										
Great Blue heron	1	Oct.	4	June to August	1	Nov.				10
American Egret	1	April	3	July to August	1	Dec.				8
Snowy Egret	2	Jan.	13	April to July	2	Dec.				20
<u>II. Shorebirds, Gulls and Terns:</u>										

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons</u> : Mourning dove White-winged dove	Resident 2500				5,000
IV. <u>Predaceous Birds</u> : Golden eagle Duck hawk Horned owl Magpie Raven Crow	Resident Resident				10 1,600

Reported by



Ernest F. Holland, 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)

UPLAND GAME BIRDS

Refuge Carolina Sandhills National Months of September to December, 19 61.
Wildlife

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total		Hunting	For Re- stocking	For Research		
E. Bob White Quail	40,000 A (All types)	9	50	2,000	45M 55F				6,000	Pertinent information not specifically requested. List introductions here.
E. Wild Turkey	40,000 A (All types)	285	1	30	60M 40 F				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.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Carolina Sandhills National Wildlife Calendar Year 1961

(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	
White-tailed Deer	46,000 (All Types)	200	25*									860	860	60F 40M

Remarks: * Hunting on lands adjacent to the Refuge. No kills on the refuge as no hunting permitted. Illegal kills not known nor recorded.

Reported by

Ernest F. Holland
Ernest F. Holland, Refuge Manager.

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) **SPECIES:** Use correct common names; 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.

Refuge Carolina Sandhills National Wildlife Year 194 1961.

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	_____	_____

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 None observed

Kind of disease _____

Species affected _____

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

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks None observed

PUBLIC USE

Refuge Carolina Sandhills National Wildlife

Calendar Year 1961

Total Use Visitor-Days	Hunting Use	Fishing Use	Miscellaneous Use
4,500	0	1,200	3,300

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

Hunting (on refuge lands):	Percent	Visitor-Days	Acres	Miscellaneous:	Percent	Visitor-Days
Waterfowl	_____	_____	_____	Recreation *	70%	3,150
Upland Game	_____	_____	_____	Official	2%	100
Big Game	_____	_____	_____	Economic Use	1%	50
Supervised by refuge _____ by State _____		No. of blinds _____		Other	_____	_____

Hunting (off
refuge lands): Estimated man-days of hunting on lands
adjacent to the refuge 4,000 (These figures
should not be included in hunting-use totals above).

Fishing:

Acres of ponds or lakes 64 and miles of streams
6 open to fishing.

Comments:

Fishing success -- fair to poor.

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

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Carolina Sandhills National Wildlife Year 194
XXX 1961

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	Over Refuge		150 A		Sep.-Dec.	Poor	Drought	Replanted Stands Good
Brown top millet	Over Ref.		5A		May-Aug	Poor	Drought	
Buckwheat	Martins L.		6A		Aug-Sept.	Fair		
Germ. millet, soybeans, peas, chufas mixed	Over Refuge		73A		May-July	Poor	Drought	Complete Failure Ox Pen & Martins W/Fowl areas Soil Builder
Chufas	Refuge		6A		May	Poor	Drought	
Corn	Over Ref.		30A		Apr & May	Good		
Milo	Shaw Bottoms		5A		Aug.	Poor	Drought	
Crotalaria	Over Ref.		150A		Mar. to June	Good		
Cowpeas	Near Hdq.		12A		June	Fair		
Wheat	Near Hdq.		15A		Nov.	Good		Seed
Ryegrass	Near Hdq.		10A		Nov.	Fair		For seed Headquarters

TOTAL ACREAGE PLANTED:

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

462

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 County Cherokee 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	Acres	Bu./Tons			
Soybeans	11.25	108 Bu.	3.75	36 Bu.			15A	Wheat, oats, rye GI & C&B	150A
Bicolor	24	46 Bu.	6	11 Bu.		1737	30A		15A
Sericea	10	65 Bu.	2	13 Bu.			12A	Wheat GI & C&B	178A
Soybeans	38	494 Bu.	10	130 Bu.	14A	182 Bu. ✓	62A	Crotalaria GI	
Crotalaria	28				28A	140 Ton	28A		
Corn	30	750 Bu.	7	175 Bu.			37A		
Wheat, rye, oats					150A	150 Ton	150A		
Bm Top millet					5A	25 Bu. ✓	5A		343
Buckwheat		146 Bu.			6A	30 Bu. ✓	6A		
Chufas					6A	Failure	6A		
Corn					30A	1500 Bu. ✓	30A		
Crotalaria					150A	750 Ton	150A		
Milo					5A	Failure	5A		
Peas, cow			12A	75 Bu.			12A	Fallow Ag. Land	30A
Wheat			15A	189 Bu.			15A		
Ryegrass					10A	1 Ton	10A		
Soybeans, rye, chufas, Millet					73A	Failure	73A		

No. of Permittees: Agricultural Operations 2 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				646
Hay - Wild				2. Acreage Cultivated as Service Operation				462

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

Months of Sept. thru Dec. 1961.

(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	78 Bu.		78 Bu.		20 Bu.		20 Bu.	78 Bu.	30 Bu.	(2) 48 Bu.	
Rye	10 Bu.	61 Bu.	71 Bu.		71 Bu.		71 Bu.				
L. Bicolor	1500#		1500#		140#		140#	1360#	150#	(3) 1210#	
L. Sericea	3760#	(1) 390#	4150#		900#		900#	3250#	1000#	(4) 2250#	
Cowpeas	28 Bu.	75 Bu.	103 Bu.		28 Bu.		28 Bu.	75 Bu.	75 Bu.		
Soybeans	68 Bu.	166 Bu.	234 Bu.		62 Bu.		62 Bu.	172 Bu.	172 Bu.		
Eyegrass	200#	700#	900#		900#		900#				
Corn	223 Bu.	175 Bu.	398 Bu.	120 Bu.		100 Bu.	220 Bu.	178 Bu.		178 Bu.	
Corn seed	1 Bu.	1 Bu.	2 Bu.		2 Bu.		2 Bu.				
Crotalaria	330#		330#		330#		330#				
Milo		50#	50#		25#		25#	25#	25#		
Brn Top Millet		200#	200#		100#		100#	100#	100#		
Germ(Foxtail) Millet		100#	100#		50#		50#	50#	50#		
Buckwheat		200#	200#		200#		200#				
Wheat		189 Bu.	189 Bu.		189 Bu.		189 Bu.				

(8) Indicate shipping or collection points Refuge Headquarters

(9) Grain is stored at Refuge Area

(10) Remarks: (1) unhulled (2) 10 Bu. chufas for Piedmont Refuge-surplus 38 Bushels (3) 200# Bicolor for Piedmont Refuge - remainder may be reserved for the State Forest for their border plantings in accordance with Wildlife Management Plans or transferred to other refuges at Regional Office desire. (4) Sericea entire lot reserved for Noxubee 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~~ ~~22~~ 1961.

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

TIMBER REMOVAL

Refuge ~~Carolina Sandhills National Wildlife Refuge~~ Year ~~1961~~

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

Total acreage cut over _____ Total income _____

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

Refuge Caroline Sandhills National
Wildlife

Calendar Year 1961

Facilities

Picnic areas 1 tables 1 fireplaces 2 toilets 2
areas:

drinking water 1 shelters 1

Swimming: designated areas NO bathhouses NO

Boating: launching sites No rental facilities No

service facilities No

are motors allowed No maximum horsepower No

Camping: permitted is ~~is~~ not permitted _____

tent camps 0 total capacity 0

group camps 0 total capacity 0

hunter camps 0 total capacity 0

trailer camps 0

lodges 0 capacity 0

cabins 0 motels 0 total units 0

Tours: Season No frequency None

self-guided nature trails No is trail leaflet available? Not

self-guided auto tour route yes is tour leaflet available? No

Access estimate number in public use 4500 visitor days
points:

General - Brief statement of two to five lines on recreational opportunities available on refuge (suitable for inclusion in refuge leaflets or briefing reports).

NOTE: Sport Fishing is permitted during open season on certain lakes during the period from February 15 to November 30 each year. S. C. State license is required. No special refuge permit is required. Gasoline powered motor boats are prohibited. Caroline Sandhills offers excellent opportunities during permitted time (Over) for bird watching. Visitors not familiar with the area may tour the refuge at permitted times accompanied by refuge personnel.

INSTRUCTIONS

Supply numbers wherever appropriate. These may be estimated if necessary.

Where operation and maintenance is supervised by this Bureau, but the responsibility of a concessioner, group, or agency, indicate by a single *. Where supervision of such activities is by another Federal Bureau indicate by two **.

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REFUGE NARRATIVE REPORT
 CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE
 MAY TO AUGUST 1961

I. GENERAL

A. WEATHER CONDITIONS:

MONTH	PRECIPITATION	NORMAL	MAXIMUM TEMPERATURE	MINIMUM TEMPERATURE	MEAN
MAY	4.91	3.32	89	42	66.68
JUNE	8.47	3.86	95	50	74.75
JULY	4.06	5.40	100	58	79.86
AUGUST	6.33	5.36	98	58	77.53
Total:	23.77	17.94	Extremes: 100		42
Normal:	17.94				
Overage:	5.83				

Mean Temperature for period: 74.71

Rainfall for the period was almost six inches above normal and about 3 inches above that of the same period during 1960. On June 26 hail struck a section of the refuge at TT 116 and TT 8, slightly damaging corn planted in that area. The local peach crop was also damaged. Although the extremes, maximum 100 and minimum 42 were the same as the corresponding period last year, the temperature averaged 1.83 degrees cooler this period. The month of July 1961 was hot and dry showing a mean of 1.46 degrees hotter than last July - 1960 and 3.86 inches less rain. The rainfall for July was 1.34 inches below normal.

B. HABITAT CONDITIONS:

1. Water: Water levels were maintained in accordance with the water management plan. There was no shortage of water due to the hot dry weather of July.

2. Food and Cover: Food and cover for all types of wildlife was sufficient during the period. Fields of Cooperative farmers was utilized as well as the refuge acreages of food patches during the period and will continue to furnish food and cover required by the population of wildlife. There is no anticipation of artificial feeding except the decoys (Canada Geese) at Martins Lake and Ox Pen pond.

One item of interest under this section concerns the 4,405 acre forest fire that occurred on April 8, 1960. This fire brought back into production at least 1,000 acres of lowtush huckleberries on the high sand ridges within the burned area. There are at least 3 species of this shrub ranging in height from 4 to 12 inches and they produced an abundance of fruit from late June into September. This is preferred food for doves, Bob-white, turkey, coons, fox and deer.

A. MIGRATORY BIRDS:

On the 26th of May a brood of wood ducks was observed using the area that goose decoys artificially feed in at Martins Lake. There was nine very small ducks and an adult observed at first but as time passed the number decreased until the last observation showed only 5 young with an adult. There is no indication that there is a great increase in the wood duck population on the refuge.

There is no change in the number of water and marsh birds using the refuge.

The dove population during the period appears to be normal. On the fourth day of August a flock of approximately 1,000 was observed on the sericea planting in the ox pen area.

B. UPLAND GAME BIRDS:

The abundant pairs of quail reported in the previous narrative had some success at nesting. Young coveys were observed in different areas of the refuge. There is no indication that the refuge is over stocked with quail.

Turkey have been observed in the field. Young and old were seen in numbers up to 15 in one place. There appears to be a slight increase over the last report period and there is a continuation of movement into new areas.

C. BIG GAME ANIMALS:

Deer are in excellent physical condition both on and off the refuge. Antlers shedded have up to 6 points on each and are comparatively large. The heaviest concentration of deer is in the Martins Lake area but they are scattered over the entire refuge and adjacent areas. Each hunting season brings an increase in the numbers hunting deer on lands adjacent to the refuge.

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

Foxes and bob-cats have been observed in different areas on the refuge during daylight hours.

There is no increase or decrease to report in the rodent population. Beaver continues to work streams on the refuge and adjacent lands. In some instances the landowners would like to get rid of the beaver or vice versa. The o'possum population is normal. The cotton tailed rabbit has continued to increase during the period but there is no alarming number present at this time.

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

This group does not present a problem to the refuge or adjacent lands. Reports from adjacent farmers indicate damage by the crows to watermelons, pecans and peaches. Tomatoes in gardens were destroyed by crows as they began to ripen and this seems to be a first for this to happen in this area. Indications are that the crow population is on the increase. There have been no reports of heavy concentration of any of the birds in this category, they are scattered all over this area including the refuge.

F. OTHER BIRDS:

No change to report.

G. FISH:

The increased pressure reported in the January to April report disappeared and fishing became normal again. There was no indication that there was an increase over the same period last year. The removal of the permits did not increase the number of people fishing the lakes and ponds.

Fertilization of the lakes was begun on the 17th of May and continued throughout the period. By the middle of June the fertilizer had begun to pay off.

There has been no record kept of fish harvested from the lakes but from reports some caught their limit while others were not so lucky as to catch the first fish.

On August 17, 1961 Mr. Don Estes (Fisheries Biologist, Atlanta, Georgia) checked the lakes and only part of the 9 lakes showed reproduction as they should have. A written report of Mr. Estes' findings is not available at the writing of this report.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. PHYSICAL DEVELOPMENT:

During the period approximately 40 miles of truck trails were machined. Clay was also hauled and placed in deep sandy spots on some of the truck trails. It will be necessary to patch other sandy areas with clay as time permits. Sand and gravel was hauled and placed on the road at headquarters to raise the roadbed so that water would run down the sides instead of the middle of the road.

The bridge on Old Wire Road at ham creek was repaired during the period by blocking up under it where the water had worked out under a mud-sill. It was necessary to put new decking on the bridge. The bridge is now safe for crossing. Heavy equipment is now able to move over the bridge.

B. PLANTINGS.

1. Aquatics and Marsh Plants.

None.

2. Trees and Shrubs.

None.

3. Upland Herbaceous Plants.

None.

4. Cultivated Crops.

The crops being grown on the refuge consist of the following acreages: Corn 67, soybeans in rows 80, soybeans, peas and chufas broadcast 90, crotalaria 100 milo 5, buckwheat 4, millet 3, chufa in rows 6, peas in rows 16.

The peas and soybeans planted broadcast have been browsed heavily by deer but some may be allowed to mature. Corn yield is above average for the sandhills especially refuge corn planted at Ox Pen and Martins Lake area for waterfowl. Soybeans planted in rows look good and a good yield is expected.

The hot dry weather of July did not damage crops as expected but hindered planting operations some. Additional acreage of millet could have been planted if moisture conditions had been better. Volunteer millet in most of the food patches has furnished food and will continue to do so during the months to come.

C. COLLECTIONS AND RECEIPTS:

None

D. CONTROL OF VEGETATION:

14 acres of swamp bottoms in the Ox Pen area was treated with 2,4D, 5T in June and July, a summary report will appear in the next narrative report.

E. PLANNED BURNING:

None.

F. FIRES:

There are no fires to report during the period. The Swift Strike maneuver during August brought no added fire activity to the area.

IV. RESOURCE MANAGEMENT

A. GRAZING:

The cattle grazing and waterfowl wintering area at Ox Pen (Mr. G. S. Cator Permittee) was in excellent condition during the period. A green blanket with approximately 100 head of cattle occupied the area this period.

V. PUBLIC RELATIONS

A. RECREATIONAL USES:

There were picnic groups using the area at the Lake Bee picnic shed, others carried a picnic lunch while fishing on the lakes and ponds.

B. REFUGEE VISITORS:

Mr. Charles S. Cook - General Engineer, Atlanta, Ga.	May 2, 1961.
Mr. Gerald F. Baker - Santee N/W Refuge Summerton, S. C.	May 4, 1961.
Mr. Rembert Jones - S. C. W/Life Resources Commission	May 4-15, Aug 8, June 7
Mr. Eugene F. Jordan - Crop Reporting Service USDA	June 5
Mr. William C. Lehmann - Game Management Agent W/Conservation Camp Group	June 7
Mr. J. T. Burch - S. C. W/Life Resources Commission	June 7-8
Mr. Victor A. Johnson - USA, Ft. Bragg, N. C.	June 21-July 19
Mr. W. D. Dingle - Santee N/W Refuge, Summerton, S. C.	July 10
Mr. Horrie W. Womble - Savannah N/W Refuge, Port Wentworth, Ga.	July 13
Mr. Parker B. Smith - Asst. Reg. Supervisor - Branch of Mgt. and Enforcement	July 25
Mr. Ray Don Estes - Fishery Management Biologist, Atlanta, Ga.	Aug. 17, 18
Mr. D. B. Holland, Columbia, S. C.	August 21
Mr. Joe Dabney - Assoc. Editor - Florence Morning News, Florence, S. C.	August 24
Mr. Jimmy D. Utsey - Cape Romain N/W Refuge, McClellanville, S.C.	Aug. 29
Mr. George R. Garris - Cape Romain N/W Refuge, McClellanville, S. C.	Aug 29

C. REFUGEE PARTICIPATION:

No meetings were participated in by refuge personnel.

D. VIOLATIONS:

There were no cases or disposition of cases during the period. Local State enforcement personnel visited the refuge area and office during the period.

E. SAFETY:

During the period four (4) monthly and one special boat safety meeting was held. The boat safety meeting was held during National Safe Boating week (July 2-8, 1961) in which the rules governing boating safety were discussed. The regular monthly meetings were used to review safety bulletin and reports made by Region 4 as well as other publications of the U. S. Department of the Interior. Accidents which occurred in the Branch of Refuges as well as other Branches of the service were discussed as to how they occurred and how they could have been prevented. The meetings were open to discussion for unsafe conditions existing at this station and how they could be made safe with corrections being made after the meetings.

The minutes of the last safety meeting (dated August 29, 1961) shows that there has been 368 days since a lost time accident occurred at this station.

This station plans to correct any hazardous conditions existing if possible and continue a chain of safety thought in the minds of all employees pointing out safe and unsafe ways of accomplishing work.

VI. OTHER ITEMS

A. ITEMS OF INTEREST:

The first 3 weeks of August the U. S. Army held their airborne maneuvers "Operation Swift Strike" in the sandhills area of North and South Carolina with field headquarters at Patrick and in the adjacent Carolina Sandhills Wildlife Management area. This maneuver disturbed all regular refuge work programs adding many hours of "off duty" work to regular refuge personnel. Approximately one half the refuge area, including the Cox Fen and Martins Pond waterfowl areas, was closed to the maneuvers. The Army respected the restricted area with minor exceptions and is to be commended for their cooperation. One of the largest air drops of men and equipment was carried out on August 11 in a new clearing of 350 acres at the intersection of Old Scotch Road and Ruby and Hartsville Road in the eastern part of the refuge when the 101st Airborne Division of Fort Campbell, Kentucky dropped 4,000 paratroops with all their vehicles, ammunition, food, medical supplies, etc. in 1 hr. An estimated 3,000 spectators from several adjacent counties witnessed the show and believe me it was "a show". Some photographs of the actual drop and a portion of the crowd is attached at the end of this report.

The Dixie Pipeline Company of Tulsa, Oklahoma began the construction of an 8 inch liquid petroleum gas pipeline through the refuge in early August. The line originates in the vicinity of Houston, Texas and terminates at Apex, North Carolina in the vicinity of Raleigh, North Carolina. Regular inspections of the various phases of this construction has added and will add to the workload of this understaffed station.



ERNEST F. HOLLAND,
Refuge Manager

SUBMITTED: September 14, 1961.

APPROVED: _____

Victor W. Kay
Acting Regional Refuge Supervisor
Sept. 15, 1961



1. "Operation Swift Strike" - a portion of the 4,000 paratroopers who "Hit the Silk" (nylon really) on August 11, 1961 at Scotch Road and Ruby-Hartsville road.



2. Vehicles - Jeeps and Personnel Carriers being dropped with 24 Ft. single and double, nylon parachutes.



3. Closeup of double chute that lowered a vehicle at moment of impact - chutes are beginning to fold after "spilling air", hooks automatically detach chute from vehicle on impact with the ground.



4. Portion of civilians who had a grand stand view of the air drop. Vehicles are parked in refuge field adjacent to Ruby-Hartsville road.



5. Another view of spectators at the air drop. Vehicles were parked for 2 miles along Ruby-Hartsville Road.



6. Spreading fertilizer and seeding buckwheat and millet on draw down margin of Little Martins Pond in the Martin's Pond waterfowl area in early August, note mature corn in background.



7. First operation in preparing *Lespedeza sericea* field for over-seeding of winter browse. A rotary mower is set to cut the plants approximately 12 inches above ground, the second operation which occurs about 2 weeks later will mow the stubble to ground level and overseeding of small grain with a disc type drill will follow.



8. One type of duck trap used for trapping wood ducks.



9. Dove traps set for wood ducks.



10. Don Estes, Fishery Management Biologist, sampling production on Lake Seventeen.



11. Dixie pipeline Company operation on western boundary of refuge.



12. Dixie Pipeline Company operation in interior of refuge, looking east from Truck Trail 8.

WATERFOWL

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF May TO August, 1961

(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	22	22	32	40	48	42	42	40	40	40
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<u>Coot:</u>										

W A T E R F O W L

REFUGE Carolina Sandhills National Wildlife Refuge (Continuation Sheet) MONTHS OF May TO August, 1961

(1) Species	(2) Weeks of reporting period								Production	
	11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Brood seen: total Est
<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	40	38	38	38	38	38	38	38	4718	1 : 50
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<u>Coot:</u>										

TOTAL DAYS USEPEAK NUMBERTOTAL PRODUCTIONSUMMARY

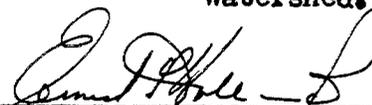
Swans
Geese
Ducks
Coots

47184850

Principal feeding areas: Refuge Lakes and beaver ponds.

Principal nesting areas: Black creek bottoms and Ham Branch watershed.

Reported by:



Ernest F. Holland, Refuge Manager.

3-1751

Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS

(other than waterfowl)

Refuge Carolina Sandhills N. C. Refuge Months of May to August 1957 1961.

(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
<u>I. Water and Marsh Birds:</u>										
Great Blue Heron			4	June to August						9
American Egret			6	July to August						11
Snowy Egret			17	June to July						26
 <u>II. Shorebirds, Gulls and Terns:</u>										

(over)

(1)	(2)	(3)	(4)	(5)	(6)	
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	Resident	4500	August		2000	7,000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	Resident	1200	June to August		500	1,700

Reported by

Ernest F. Holland

INSTRUCTIONS

Ernest F. Holland, 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.

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

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

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Carroll County Wildlife For 12-month period ending August 31, 1961.

Reported by Mr. Ernest F. Holland Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type Acreage	(3) Use-days	(4) Breeding Population	(5) Production
	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		
TOTALS:	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. C. Refuge~~ Months of ~~May~~ to ~~August~~, 19 ~~61~~

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total		Hunting	For Re- stocking	For Research		
E. Bob White	41,927	7	60	3500					6,500	Pertinent information not specificoally requested. List introductions here.
E. Wild Turkey	41,927	281	7	60					160	

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.

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REFUGE NARRATIVE REPORT
CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE

JANUARY TO APRIL 1961

GENERAL

A. WEATHER CONDITIONS:

Below normal temperatures continued during January, giving South Carolina the coldest December-January period since the record cold of the 1917-1918 winter. Freezing rain, sleet and snow fell throughout most of South Carolina from the night of the 25th to the afternoon of the 26th. Temperatures were near or below freezing from the evening of the 20th to the morning of the 31st. Schools were closed and there was damage to power and communication facilities during the period of the 25 to the 27th. Rainfall was deficient during January.

February rainfall was over 3 inches above normal. Most of the rainfall occurred from the 19th to the 28th of the month. There was a general glaze in South Carolina on the 3rd and 4th. There were snow flurries, freezing rain and sleet. Public service and transportation suffered considerably. Schools were closed on the 3rd and 4th. On the evening of the 24th a squall brought heavy to excessive rains dumping over 3 inches in one day over this area. This was accompanied by small dipping tornadoes which lasted a short time. Flash floodings resulted as many lakes and ponds overflowed. Wind damage to roofs, TV aerials, wires and signs occurred with gusts being recorded at 51 miles per hour on the 25th.

March rainfall during this month was over 2 inches above normal. Nice spring-time weather was experienced throughout March with daytime temperatures of 70 degrees or better during a scattered 15 day period throughout the month.....a welcome change from the cold of previous months. As usual however March was a windy month but it's extreme severity was lacking.

April rainfall was excessive during this month, occurring during the first, middle and last of the month. Frost conditions were experienced during the 11th and 14th of the month. No serious damage was done due to free circulation of air. A wind of 40 miles per hour occurred on the 15th and 16th of the month. Generally April brought cool Springy weather to South Carolina coupled with excessive rainfall, topped with an excelsior panorama of gay beauty that decked the area with the finery of flowering dogwood and azaleas....creating a breath-taking sight to behold..... a vivid picture of the Southland boast of: "Nothing could be finer than to be in Carolina in the morning."

MONTH	PRECIPITATION	NORMAL	MAXIMUM TEMPERATURE	MINIMUM TEMPERATURE
JANUARY	2.01	3.26	68	12
FEBRUARY	6.44	3.25	75	21
MARCH	6.06	3.95	84	30
APRIL	5.41	3.80	90	33

B. HABITAT CONDITIONS:

1. Water:

Water was plentiful during the period. The lakes and streams were above normal in their water level due to the precipitation of 19.92 inches as compared to the normal precipitation of 14.26 inches. There was no excessive erosion due to the amount of water falling during the period. The 5.66 inches of precipitation above normal was 3.69 inches less than the above normal rainfall for the same period last year. During January, February, March and April of 1960 there was 9.38 inches of precipitation above the normal of 14.26. There was enough water to keep the ground in a moist to extremely wet condition.

2. Food and Cover:

There was an ample supply of browse furnished by the plantings of wheat, rye, oats and ryegrass. Temperature during the period rose high enough for the plants to make growth and by the end of April there was an excessive growth that had to be mowed before turning under in preparation for planting other crops. The chufas planted last summer furnished food during the period. Corn planted at Martins Lake and the Ox Pen area furnished food throughout the waterfowl season. Some corn was removed from the grain bin and distributed for use by upland wildlife over the refuge. Patches planted to clover and ryegrass were used heavily by all types of wildlife. The supply of natural foods was good and helped to winter the population of wildlife.

The plantings of clover, ryegrass, and wheat were utilized more than other plantings of browse made last season.

II WILDLIFE

A. MIGRATORY BIRDS:

1. Waterfowl:

There was an increase in the number of Geese use days over the September to December 1960 report. The thirteen weeks reported in the September to December period had 55,300 use days and eleven weeks during the January to April with 73,150 use days. The peak number of geese for one week during the season was 1500 compared to 1000 during the last report period and also 1000 during the last waterfowl season. The Canada goose population continues to increase each migration. Geese used areas that they had not been in at Ox Pen and Martins Lake area; they were also observed in the old chufa clearing at the intersection of TT 116 and TT 9 on several occasions.

The duck population increased over the last report period and more than doubled over last seasons total days use. The peak number for any one week during this period was 2050 which is an increase over previous waterfowl migratory seasons.

Food, both corn and browse was plentiful and utilized by the geese and ducks. Only a few acres (2-3) of corn at Martins Lake area was not consumed during the season. The areas planted to browse at both areas (Martin and Ox Pen) were used satisfactory but some of it being used more heavily than other areas.

2. Mourning Doves:

There was no noticeable change in the dove population from the previous report period and no mortality was noted. The doves ate their share of corn in the waterfowl areas and other areas where corn was scattered for wildlife. Doves were observed over most of the refuge.

B. UPLAND GAME BIRDS:

1. Quail:

By the end of the period pairs of quail could be seen at almost any point on the refuge. There seems to be an ample supply of breeding stock. The possibility of an increase in population is excellent and lets hope we will not be disappointed.

2. Eastern Wild Turkey:

Observations indicate that the wild turkey is on the increase. They were observed in areas over most of the refuge in flocks ranging in numbers up to 23. By the end of the period lone hens were seen moving around in different areas, indicating that nesting had begun. The food patches planted to chufa, millets, buckwheat and the clovers were frequented by the turkey. Areas planted to chufa seemed to have preference over other foods. Corn and cracked peas were scattered in areas for turkey food and utilized by them, and other wildlife.

C. BIG GAME ANIMALS:

Deer are abundant on the refuge and adjacent lands. They are observed daily in numbers ranging from 1 to six in one area and in all areas of the refuge. The past hunting season yielded deer for the hunters on lands adjacent to the refuge. In all cases the hunter seemed to be pleased for most of them observed deer on the hunt. There has been no attempt to determine the number killed during the past season but reports indicate that the number exceeds that of any previous season.

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

There seemed to be no major increase or decrease in the population of this group. There might be a slight decrease in the predators on the refuge but no census has been made.

The trapping program was continued during the period and yielded a total for the year of 54 raccoons, 3 o'possums, 27 skunks, 35 gray fox, 28 red fox and 8 bobcats. The catch during last year was 55 raccoons, 13 o'possums, 15 skunks, 40 gray fox, 27 red fox and 13 bobcats. Rodents and other mammals were observed but there is no reportable change.

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

These birds show no reportable increase or decrease. They are sufficient in numbers but have not been destructive in nature, except the crow has been destructive to watermelons wherever planted. The crow inhabits adjacent land as well as the refuge.

F. OTHER BIRDS:

There is no change to be reported in the birds under this heading.

G. FISH:

The beginning of this period tells a new story in this part of the report. As of January the first, the permit was not required (even though the charge was small \$.50 per day and \$2.50 per season) and this has increased the number of people fishing in the refuge lakes and ponds. There has been an increased activity on the banks and in boats, but the number of fish caught is not known.

There was no fertilization of the lakes due to the low temperature (60%) of the water. Plans are being made to begin fertilization as soon as the temperature rises. The above normal rainfall might have contributed to the continued low temperature of the water. There is a continued flow of water through the lakes, even in the driest weather.

III REFUGE DEVELOPMENT AND MAINTENANCE

A. PHYSICAL DEVELOPMENT:

Approximately 7 acres of land has been cleaned in preparation of planting a chufa nursery. Another 5 acres was cleared of brush at Ox Pen. The area at Ox Pen to be planted this fiscal year to sericea lespedeza and worked into the waterfowl area there. Sericea has been planted on all land that is ready except an acre or two which was too wet at the time of preparation and planting.

A few yards of gravel and sand were hauled and placed in low places on the road at headquarters. Approximately 1,000 yards of dirt was moved with front end loader and dump trucks to fill on the lower side of Quarters #1, then ryegrass was sown on the fill.

During the period 40 miles of truck trails were machined with the grader. One small bridge was built on truck trail 8 near highway 85 and a truck load or two of sand and gravel dumped by it and leveled.

All refuge lakes opened to fishing were posted and the Federal Regulations framed and hung at the lakes setting forth the conditions under which the public may fish in refuge lakes.

All water and sand barrels and buckets and shovels for fire protection of the headquarters area were painted. Two water barrels were replaced and the interior painted with a rust preventitive. New water buckets were purchased and marked water for fire use only. Sand barrels were marked sand and water marked water.

Fire extinguishers on the refuge were checked and those needing refilling were refilled.

B. PLANTINGS:

1. Aquatic and Marsh Plants:

None

2. Trees and shrubs:

The State Forestry Commission planted 275 acres of longleaf pine seedlings on the refuge in a clearing near Sugar Loaf Mountain adjacent to the refuge near Ruby-Hartsville road. Approximately 114 acres were planted, near the same area, to seed using a plow to open a furrow, then planting the seed with a planter. A tractor (track type) with a fire plow on front of it and a man with a horse drawn planter attached to the tractor in the rear was used to plant the seed. The planting of seed looks promising at this writing. Germination seems to be excellent and it will be interesting to watch this planting.

3. Upland Herbs:

None

4. Cultivated Crops:

The above normal rainfall delayed spring plantings. During the period approximately 23 acres of corn was planted at Martins Lake and Ox Pen area. Approximately 50 acres of crotonaria has been planted at Martins Lake, Ox Pen and in food patches on the refuge as a green manure crop. The crotonaria will be disked under and browse planted there during the fall months.

C. COLLECTION OF RECEIPTS:

None

D. CONTROL OF VEGETATION:

There was no use of herbicides during the period.

E. FIRES:

No fires during the period.

IV PUBLIC RELATIONS

A. Recreational Uses:

The fishermen began looking the lakes over early in January, they had heard that "No Permits" would be required for fishing the lakes. As soon as the weather permitted fishing from boats and banks began and continued throughout the period.

There was bird watchers present at Martins Lake to observe the waterfowl there. Others travelled the truck trails to see all types of wildlife.

REFUGE VISITORS:

Dr. Ira Gabrielson - Pres. Wildlife Management Institute, Wash. D.C.	1/22/61
Mr. Redmond Paine - League of Kentucky Sportsman Inc., Kentucky	3/6/61
Mr. H. L. Riesen, ASC, Chesterfield, S. C.	3/22/61
Mr. H. W. Pate - ASC, Chesterfield, S. C.	3/22/61
Mr. J. T. Burch - S. C. Game Dept., Cheraw, S. C.	3/30/61
Mr. J. D. Utsey - Cape Romain Refuge	3/30/61
Mr. Garrell Ryan - Cape Romain Refuge	3/30/61
Mr. Island H. Barrineau - Property Management Officer, Atlanta, Ga.	4/4/61
Mr. William E. Ackerschicht, Asst. Chief, Washington, D. C.	4/9/61
Mr. Winston E. Barko, Section Wildlife Management, Wash. D. C.	4/9/61
Mr. Donald J. Hunkla, Wildlife Management Biologist, Port Wentworth, Ga.	4/13/61
Mr. Marion L. Watts - ASC Office, Chesterfield, S. C.	4/13/61
Mr. Theodore Hunter - Mayor, Patrick, S. C.	4/14/61
Mr. William L. Towns-Chief, Div. of Technical Services, Atlanta, Ga.	4/26/61
Mr. R. E. Dudolph Jr., Wildlife Management Biologist, Atlanta, Ga.	4/26/61
Mr. H. O. Starlings, Tulsa, Oklahoma	4/28/61
Mr. Herbert A. Noble, Sterling, Colorado	4/28/61

C. REFUGE PARTICIPATION:

The personal contacts with the public was the only public relations participated in by Refuge Personnel.

D. REFUGE PHOTOGRAPHS:

Photographs attached.

SUBMITTED: May 5, 1961.

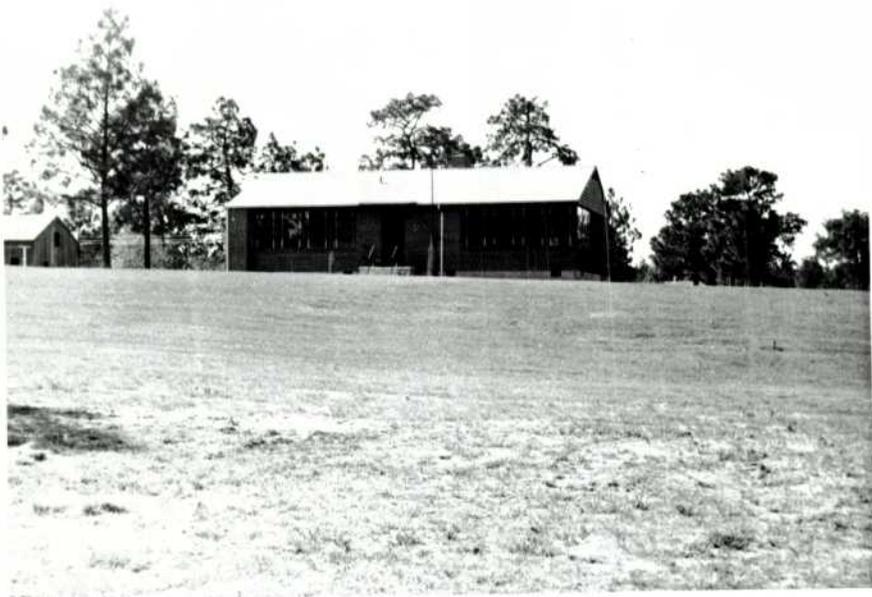
APPROVED:

Victor W. Kay

Acting Regional Refuge Supervisor
May 9, 1961

Ernest F. Holland

ERNEST F. HOLLAND,
Refuge Manager.



Quarters No. 4, front view after placing 1000 cubic yards of backfill to partially level for landscaping.



Part view of refuge headquarters from U. S. Highway No. 1



Typical upland game food patch. Slash from clearing is piled through center of clearing to provide nesting sites and escape cover for turkeys and bob-white quail.



Closeup of slash in center of food patch.



State Forest Service experimental pine seed planting in scrub oak habitat in refuge. Fire plow mounted on dozer frame of D-4 Caterpillar tractor opens an 18 inch wide furrow, a horse drawn type corn planter towed by tractor plants longleaf pine seeds at predetermined spacing in the furrow.

W A T E R F O W L

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF January TO April, 19 61.

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling Trumpeter										
Geese:										
Canada	900	1000	1000	1000	1200	1200	1500	1500	750	200
Cackling Brant										
White-fronted Snow										
Blue Other										
Ducks:										
Mallard	1700	500	1000	1000	1000	1000	1000	1000	500	150
Black	300	200	500	500	500	500	500	500	250	50
Gadwall										
Baldpate										
Pintail										
Green-winged teal		75								
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood	50									
Redhead										
Ring-necked		20	30	30	30	30	30			
Canvasback										
Scaup										
Goldeneye										
Bufflehead		50								
Ruddy										
Other										
Coot:	25	8								

WATERFOWL
(Continuation Sheet)

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF January TO April, 19 61.

(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	200								73,150		
Cackling Brant											
White-fronted Snow											
Blue Other											
<u>Ducks:</u>											
Mallard	150								63,000		
Black	50								26,950		
Gadwall											
Baldpate											
Pintail											
Green-winged teal									525		
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood									350		
Redhead											
Ring-necked									1400		
Canvasback											
Scaup											
Goldeneye											
Bufflehead									350		
Ruddy											
Other											
<u>Coot:</u>									231		

(over)

	(5)	(6)	(7)
	<u>Total Days Use</u>	<u>Peak Number</u>	<u>Total Production</u>
Swans			
Geese	73,150	1500	
Ducks	92,575	2050	
Coots	231	25	

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
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	1900			5,500
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	RESIDENT RESIDENT				10 1800

Reported by...



ERNEST F. HOLLARD, 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.

Refuge Carolina Sandhills Refuge Months of January to April, ~~1960~~ 1961.

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'd.	Estimated Total		Hunting	For Re- stocking	For Research		
E. Bob-White	40,000 (All types)	10							4,000	Pertinent information not specifically requested. List introductions here.
E. Wild Turkey	40,000 (All cover types)	260							154	

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 Refuge

Year ending April 30, 1961.

(1) Species Common Name	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion	
	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			54									950
Beaver	6,500	12												542
Mink	6,500	130												50
Otter	6,500	130												50
Muskrat	6,500	86												75
O'Possum	40,000	200			3									200
Skunk	40,000	200			27									190
Gray Squirrel	40,000	133												300
Fox Squirrel	40,000	80												500
Gray Fox	40,000	133			35									265
Red Fox	40,000	133			28									272
Bob Cat	40,000	400			8									292

* List removals by Predator Animal Hunter

REMARKS: Raccoons, foxes and bobcats show slight decline as a result of our regular yearly trapping program. This refuge program has kept the predators in check otherwise we might of had an over population.

Reported by

Ernest F. Holland

ERNEST F. HOLLAND, 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.

REFUGE GRAIN REPORT

Refuge Carolina Sandhills

Months of January thru April 194 1961.

(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.	100 bu.			100 bu.	98 bu.	20 bu.		78 bu.
Oye	10 bu.		10 bu.				10 bu.	10 bu.	10 bu.		
L. bicolor	1240 #	200 #	1440 #		140 #		140 #	1300 #	140 #		1200 #
L. bericea	5460 #		5460 #	800 #	900 #		1700 #	3760 #	600 #		3160 #
Coapeas	28 bu.		28 bu.				28 bu.	28 bu.	28 bu.		
Soybeans	68 bu.		68 bu.				68 bu.	68 bu.	68 bu.		
Uge grass	200 #		200 #				200 #	200 #	200 #		
Corn	323 bu.		323 bu.			100 bu.	100 bu.	223 bu.		223 bu.	
Corn seed		3 bu.	3 bu.		2 bu.		2 bu.	1 bu.	1 bu.		
Grotalaria		1230 #	1230 #		900 #		900 #	330 #	330 #		

- (8) Indicate shipping or collection points refuge and quarters
- (9) Grain is stored at refuge and quarters
- (10) Remarks Surplus may be disposed by transfer to other refuges by Regional Office.

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.