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ANNUAL REFUGE NARRATIVE REPORT  
CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE

JANUARY - DECEMBER 1964

I. GENERAL

A. WEATHER CONDITIONS:

Precipitation

	<u>This Month</u>	<u>Normal</u>	<u>Max Temp.</u>	<u>Min. Temp.</u>
January	7.46	3.26	71	15
February	6.18	3.25	63	22
March	5.86	3.95	82	22
April	3.19	3.80	90	34
May	1.30	3.32	98	47
June	8.49	3.86	101	58
July	9.96	5.40	91	57
August	5.29	5.36	95	56
September	5.68	4.14	92	42
October	6.38	2.46	83	32
November	1.68	2.80	81	23
December	<u>3.92</u>	<u>3.46</u>	76	15
Totals:	65.39	45.06		

Weatherwise, 1964 might be characterized as wet, with 10 of the 12 months receiving surpluses of rainfall and lulls in precipitation occurring only in May and November. More than 20 inches of excess rain were recorded for the year with July receiving 9.96 inches in 17 days. As a result of the ample moisture crops were good but the ugly face of erosion was much in evidence. Road work was hampered and replacing of washed out fill was a common occurrence.

The last frost of the winter occurred on April 10 with the last killing frost on March 11. The temperature dipped to an unseasonably cold 22 degrees on March 31 killing an estimated 93% of the peach crop in Chesterfield county and representing a loss of more than \$1,000,000 to the local economy. Jack Frost paid an early visit to the Sandhills this fall when he blanketed low lying areas with his white frosting on October 12 killing late maturing crops such as Crotalaria, Nicotia, and Sericea. The impact of these lost seed sources will be felt when spring planting time comes in 1965.

B. HABITAT CONDITIONS:

1. Water

As part of an intensified water management program initiated in 1962, six refuge impoundments were completely dewatered to allow natural

vegetation to encroach upon the lake beds and replace the obnoxious watermilfoil which has been flourishing so abundantly. Two other lakes were drawn to 1/2 capacity to expose the shore line to the elements in an attempt to kill white waterlily and milfoil. Otherwise, seven other refuge lakes were held at full pool throughout the year and Lake Bee was renovated after 7 years of idleness to add 12 acres of water to the refuge program. Eleven new impoundments were constructed during the year as a consequence of an Accelerated Public Works Program. Although specific management plans have not been formulated for these new pools it is anticipated that most of these 150 water acres will be maintained as green-tree reservoirs.

## 2. Food and Cover

Wildlife habitat has been reduced considerably over the past 3 years as the result of a massive scrub oak eradication program being carried out on the refuge by the cooperating agency in forest management, the South Carolina Commission of Forestry. A total of 9,969 acres have been clear cut, pushed up in windrows and burned. Following this clearing operation the areas have been or will be planted to pine plantations and while long range management will enhance these areas for upland game, the short range effects tend to reduce the effectiveness of these areas as wildlife habitat.

Natural foods were abundant with a bumper crop of acorns, bay berries, and legumes. Upland food patches have been utilized by all species of upland game with corn continuing to be the number one food preference.

## IX WILDLIFE

### A. MIGRATORY BIRDS:

Waterfowl use days continue to increase slowly but surely. The first migrant Canada geese dropped in on September 23rd and numbers increased from 7 to 1100, an increase of 200 over last year. Goose use days for 1964 were 110,825 as compared with 92,633 in 1963. Duck numbers have also increased over 1963 with 2965 presently on the area as compared with 2015 during the same period last year. Duck use days in 1963 were 126,335 as compared to 191,702 in 1964.

Uncommon visitors to the Sandhills were an Oldsquaw male and a redhead female during the week of December 1 and a male Garvasback rested on Martins Lake for several days later in December.

Mourning doves were abundant on the area with an estimated 3000 young produced on the refuge during the 1964 nesting season. Banding efforts yielded 300 birds banded during June, July, and August and disclosed a ratio of young to old, 1:1.

At least 50 waders were resident on the area during July and early August. Equal numbers of American Egrets and Little Blue Herons accounted for 90% of the number with Green Herons and Great Blues rounding out the August peak.

**B. UPLAND GAME BIRDS:**

Eastern wild turkeys have declined considerably over the past 3 years. An intensive clearing program with the associated 8000 economic use days (loggers, timber buyers, watermelon growers, etc.) during 1964 is probably the foremost reason for the drastic decline in turkey numbers. Turkey observations for the entire year by refuge personnel totaled only 28. Indications are that the flock has dwindled to 75 birds.

After a low in bob-white quail populations in 1963, extensive late nesting after the June-July rains has resulted in a bumper crop this year. Broods were known to have hatched as late as August 27 with significant numbers of small birds evident in September.

**C. BIG GAME ANIMALS:****Deer.**

There has been a noticeable shifting in deer herds and concentration areas as the result of the scrub oak clearing program. The clearing of 10,000 acres over the past 3 year period has resulted in marked egress of both sexes to areas outside the refuge. This fact has been supported by an increasing numbers of deer killed by private gun clubs on interior holdings as well as on private lands adjacent to the refuge. This year a survey revealed that at least 156 were known killed by 9 clubs with an estimated 50 more killed by individuals and groups not contacted. This number, with the 42 known killed on the refuge plus natural egress and mortality will more than offset the annual natality. With the continued killing pressure exerted on the bucks, however, the ratio of females to males is becoming excessive. This year refuge personnel will make a determined effort to secure enabling legislation to provide for harvesting of does in the fall.

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

After a 2 year decline in raccoon populations these masked vandals have staged a comeback in 1964. If the trend continues control measures will be necessary in 1965.

Fox populations also have assumed an upward trend.

Bobcat and skunk numbers remain rather constant but the squirrel population seems to have declined sharply in 1964. No specific reasons have been evidenced but indications are that squirrel numbers are down more than 40% over last year.

Beavers continue to plague duck banding operations. Three new traps were constructed in the fall and placed in Martins Lake to become familiar to the waterfowl. The traps were baited with corn whereupon beaver immediately entered by the funnel but exited through the wire at whatever place they pleased rendering the traps useless until repairs were made.

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

Red tailed hawks continue to be the most prominent resident avian predator, with Marsh hawks running a close second when the fall migration brings dozens of these magnificent birds to the area. One was observed bussing a flock of ring-neck ducks on Lake Bee. He made several passes over the ducks but despairing of their diving and dodging antics, he gave up and sailed away.

An adult bald eagle was observed in the Martin Lake area on September 4th and again on the 13th. During or about this time 3 of the decoy Canada geese disappeared from the lake so it was assumed they fell prey to the eagle. But apparently the bird wasn't in a settling mood and was seen no more after the 13th of September. At least one osprey was observed near Ox Pen Lake in early May.

## F. OTHER BIRDS:

The Spring of 1964 brought a profusion of red-headed woodpeckers to the area. Their fiery red heads were much in evidence throughout the refuge and at least 3 pairs nested in the headquarters area. Also much interest and concern were the presence of liberal numbers of red-cockaded woodpeckers on the area. Steps are being taken to insure that trees with nesting cavities are left in sufficient numbers to provide for their continuation in this area.

## G. FISH:

Public demands for fishing in refuge lakes continues to decline as the fishing success increases in 2600 acre Lake Robinson 3 miles south of refuge headquarters. Only 3 lakes were opened to fishing this year and no "bragging" sized strings were brought to the attention of refuge personnel.

Lake Bee, renovated after 7 years, was stocked with Blue-gill and Red-eared drem in October and Channel catfish in November. Bass will be added in the spring and it is anticipated that most of the fish management efforts will be channeled into the lake since it is a part of the Lake Bee recreation area and because it is such, heavier demands will probably be made upon it for sport fishing.

## H. REPTILES:

Most common of the poisonous snakes on the area in 1964 has been the cottonmouth moccasin (Atractodes piscivorus). Second in abundance have been the rattlesnakes, the Pigmy, (Sistrurus miliaris) and the Canebrake (Crotalus horridus). For the first time in several years the Copperhead (Atractodes morganii) has been noted and at least 2 large adults, 33" and 40" respectively, were killed on the area this year. The most common of the harmless snakes throughout the year has been the docile little puffadder, (Nerodia ssp.)

## I. DISEASE:

Nothing to report for the period.

### III REFUGE DEVELOPMENT AND MAINTENANCE

#### A. PHYSICAL DEVELOPMENT:

Completed during the period were several construction projects which were begun as the result of an Accelerated Public Works Project which was initiated in August of 1963. Bids were solicited in January and construction began in February. Items constructed include 2 public toilets, a deep water well, a 6 room brick residence, 2 picnic shelters, a 12 acre lake, a water system and an access road, all part of a refuge recreation facility. Also constructed were 19.5 miles of roads (8.5 paved) to serve as a main artery of access to the refuge interior. As a part of the road fill and incorporated into water control structures on waterways, 11 new water impoundments were created which when flooded will provide 150 acres of water to the management program.

#### B. PLANTINGS:

##### 1. Aquatics and Marsh Plants

None

##### 2. Trees and Shrubs

See "Forestry" under Resource Management

##### 3. Upland Herbaceous Plants

None

##### 4. Cultivated Crops

Refuge personnel cultivated 567 acres during the 1964 season. The crops are as follows:

<u>Crop</u>	<u>ACRES</u>	<u>Crop</u>	<u>ACRES</u>
Corn	53	Clovers	4
Browse(wheat & rye)	60	Wheat(seed)	10
Crotalaria	30	Sesame	20
L. Sericea	143	Chufa	4
L. Bicolor	12	Buckwheat & ryegrass	28
Pennisetum Bahia /grass	118	Peas	65

Corn yields ranged from 35 to 67.5 bushels/acre with the average yield exceeding 50 bushels/acre.

In addition to the refuge farm program three cooperating farmers cultivated the following crops on refuge lands:

<u>Crop</u>	<u>ACRES</u>	<u>Crop</u>	<u>ACRES</u>
Corn	95	Pennisetum Bahia /grass	36
Soybeans	67	Crotalaria	61
L. Bicolor	45	Rye	470

Aside from these cultivated crops, 701.75 acres of refuge farm land was allowed to lie fallow throughout the year.

For years the South Carolina Commission of Forestry, operating on Bureau lands, has cleared timber lands, rented for a season to watermelon growers then followed the melons with pine seedlings thus taking advantage of the fertilizer residues left from the watermelon operation. This year, when watermelon acreages were insufficient on the State Forest area, demands were made by the Watermelon Growers Association on lands recently cleared on the refuge for planting to pine seedlings. Of 1,037 acres made available to the growers at public auction, 921 acres were rented. The total revenue received as rental was \$8,646.35 for an average rental fee of \$9.39/acre. The growers produced an average of 400 melons per acre weighing 30 lbs. each and brought \$.35 representing a gross income of more than \$125,000 for the season's crop. The program was assessed as a good public relations move and further rentals are planned for the 1965 season.

C. COLLECTIONS AND RECEIPTS:

1. Seed or other Propagulae

Received from cooperating farmers were 14 bushels of rye and 110 bushels of corn. The refuge farming program yielded 235 bushels of wheat and 66 bushels of unhulled Lespedeza sericea.

2. Specimens

None

D. CONTROL OF VEGETATION:

None

E. PLANNED BURNING:

See "Forestry" under Resource Management.

F. FIRES:

See "Forestry" under Resource Management.

IV RESOURCE MANAGEMENT

A. GRAZING:

A ten year grazing contract with Gus Cato in the Ox Pen area was terminated on December 31, 1963. To relieve the immediate pressure on Mr. Cato's own pasture, seven acres of refuge land adjacent to Mr. Cato's property in compartment 7 were rented to him on an annual cash basis for \$5/acre.



**B. MAYING:**

None

**C. FUR HARVEST:**

None

**D. FORESTRY:****1. Plantings, Trees and Shrubs**

During the winter of 1963-64 approximately 9,000 oak seedlings ( Laurel Oak Quercus laurifolia, Live Oak Quercus virginiana, Water Oak Quercus nigra, Chestnut Oak Quercus prinus and Sawtooth Oak Quercus serrata) were set out in abandoned fields and around water impoundments. Some of the Oaks suffered from three weeks of dry, hot weather in early spring however, the Sawtooth Oak withstood the weather exceptionally well and is making good growth (see photo). On December 2, 1964 a field check revealed that 82% of the Sawtooth Oak seedlings were living.

The Live Oak seedlings in the nursery are looking good (see photo). We plan to transplant approximately 10,000 of these seedlings to our better sites during the winter of 1965.

The South Carolina Commission of Forestry has completed clearing all of the understocked pine land set up under the Scrub Oak Eradication Program. During 1964 they set out more than 2,000,000 pine seedlings.

**2. Planned Burning****a. General**

We feel that controlled burning has a vital role in our management program. During the winter of 1964 a total of 1,873 acres were subjected to this treatment at a cost of \$3.37 per acre. The primary purpose of the burn was to remove the undesirable litter on the forest floor and to open up areas where a dense understory curtails the movement of wildlife. The areas controlled burned were distributed over the forest so that optimum habitat improvement was achieved.

**b. Conditions prior to burning**

Fire has been eliminated from the areas controlled burned for several years and a dense mat of pine straw (4 to 10 inches) has accumulated (see photo). In some areas the understory vegetation was so dense that maximum use by wildlife was not achieved.

**c. Conditions following burning**

Numerous plants such as legumes, grasses, etc. came in following the burn (see photo). The sprout growth resulting from the burn was also

heavily browsed by deer. The control burn program not only improves the habitat for deer, turkey and other species of wildlife but also greatly reduces the hazard of wildfire. We plan to use a three year burn cycle on all of the areas controlled burned.

### 3. Fires

Wildfires were of little significance during this reporting period. We had only one fire which burned 75 acres of scrub oak and sparse pine timber before it was extinguished. The fire resulted in minor damage to the timber. This fire resulted from a logging operation.

### 4. Timber Removal

Timber sales made by the South Carolina Commission of Forestry during this reporting period are reported on the table on the following page (8a).

### E. COMMERCIAL FISHING:

None

### F. OTHER USES:

None

## V FIELD INVESTIGATION OR APPLIED RESEARCH

### A. Progress Report

None

## VI PUBLIC RELATIONS

### A. Recreational Uses

As a consequence of the recently completed Lake Bee recreation area many new faces were observed on the refuge. The picnic area, although still needing some more tables in the picnic shelters and landscaping throughout, was taken note of and received limited use with the coming of balmy Sundays in April with numbers of picnickers increasing as the spring gave way to summer. On May 17 more than 20 persons had Sunday dinner in the area and 13 automobiles with sight-seeing passengers passed through the picnic area in one hour. By June picnickers had increased to as many as 60 on Sundays with scores of sightseers driving through the refuge on the new roads every week end.

### B. Refuge Visitors

Mr. W. R. Jones - S. C. Wildlife Resources Dept. 1/2/64 ; 4/2/64; 6/4/64; 12/16  
 Mr. Gene Watson - S. C. Wildlife Resources Dept. 1/2/64 ; 4/2/64; 12/16/64  
 Mr. Purvis Bodenbaugh Jr. - Soil Conservation Service 1/6/64; 8/11/64  
 Mr. James R. Dawsey - Branch of Engineering 1/7/64  
 Mr. D. P. Dugan - Dixie Pipe Line Co. 1/7/64  
 Mr. H. S. Alford - L. J. Ins. Columbia, S. C. 1/9/64

4. Timber Removal:

COMPARTMENT	SALE NO.	PURPOSE OF SALE	SAWTIMBER (BD. FT.)	PULPWOOD (STD. CDS.)	ACRES	REVENUE RECEIVED
1	1	Plantation Thinning		62	9	\$841.13
2	1	Plantation Thinning		386	45	4,554.80
2	2	Plantation Thinning		166	30	2,274.16
3	1	Salvage Cut		106	30	827.27
3	2	Salvage Cut		13	5	99.71
4	1	*S.O.E.P.	213,415	631	603	11,111.00
4	2	Plantation Thinning		81	4	714.23
4	3	Plantation Thinning		291	21	3,259.71
5	1	Improvement Cut	420,165	654	336	20,325.50
5	2	Improvement Cut	342,673	244	186	14,721.00
5	3	Improvement Cut	285,966	249	158	13,501.00
5	4	Improvement Cut	265,361	372	286	13,217.71
5	5	Improvement Cut	104,765	187	182	6,014.00
5	6	Plantation Thinning		89	29	1,073.00
5	7	Improvement Cut	443,602	386	275	19,689.20
6 and 7	1	* S.O.E.P.	155,372	530	484	9,608.76
6 and 4	2	* S.O.E.P.	284,356	824	671	15,750.50
6	3	Improvement Cut	282,659	1,029	370	27,355.00

4. Timber Removal (Cont'd.):

(85)

COMPARTMENT	SALE NO.	PURPOSE OF SALE	SAWTIMBER (DB. FT.)	PULPWOOD (STD. CDS.)	ACRES	REVENUE RECEIVED
6	4	Improvement Cut	437,802	1,142	398	\$33,626.00
8	1	Plantation				
		Thinning		205	47	2,234.68
8	2	Plantation				
		Thinning		34	6	174.58
9	1	Salvage Cut		18	15	193.93
10	1	Plantation				
		Thinning		269	18	2,959.89
Special Sale		Timber Removed From A.P.W. Projects	10,265	26		340.50
TOTAL			3,246,401	7,974	4,208	\$204,367.37

\* SCRUB OAK ERADICATION PROGRAM

Mr. Ed. Jordan - L.J. Ins. Columbia, S. C. 1/9/64  
Mr. Otis G. Pauley - Br. of Engineering, Atlanta, Ga. 1/7 ; 2/20/64/22/6/25  
Mr. A. D. Plowden - Plowden Const., Sumter, S. C. 1/9  
Mr. Charles Bolden - Plowden Const., Sumter, S. C. 1/9  
Mr. Davis Menagno, Columbia, S. C. 1/9/64  
Mr. Harry E. Stiles - Reg. Supervisor, Minneapolis, Minn. 1/12/64  
Mr. Ferrest Carpenter - Refuge Supervisor, Minneapolis, Minn. 1/12/64  
Mr. Howard S. Macnecks - Operations - Washington, D. C. 1/12/64  
Mr. James W. Salyer - Dept. Trainee - Washington, D. C. 1/12/64  
Mr. Dave Hedick - Charles Russell N.W. Refuge, Lewistown, Montana 1/12/64  
Mr. Francis G. Gillett - Washington Office, Wash., D. C. 1/12/64  
Mr. Roy C. Krickson - Region 2, Albuquerque, New Mexico 1/12/64  
Mr. Noble S. Suell - Washington Office, Wash., D. C. 1/12/64  
Mr. John Kadie - Washington Office, Wash., D. C. 1/12/64  
Mr. Sam Fox - Fox Const. Co., Orangeburg, S. C. 1/14/64  
Mr. A.K. Roberts - Fox Const. Co., Orangeburg, S. C. 1/14/64  
Mr. J. M. Dowd - Dowd Const. Co., Fountain Inn, S. C. 1/14/64  
Mr. Preston Smith - Concord, N. C. 1/15/64  
Mr. W. E. Copeland - Copeland Const. Co., Orangeburg, S. C. 1/15/64  
Mr. B. S. Lard - Cleckley & Co., Orangeburg, S. C. 1/15/64  
Mr. Curtis Satterfield - Greenwood, S. C. 1/17/64  
Mr. W. J. McLamb - McLamb & Son Const. Co., Charlotte, N. C. 1/20/64  
Mr. W. S. Podin - Boyle Const. Co., Sumter, S. C. 1/21/64  
Mr. Verlon Carter - Forester, Atlanta, Ga. 1/21; 5/18 5/19  
Mr. Crayton J. Lankford - Soil Conservationist, Atlanta, Ga. 1/21  
Mr. W. J. Thee, Woodruff, S. C. 1/21/64  
Mr. Jesse A. Jordan - SCS, Columbia, S. C. 1/21/64  
Mr. William W. Neely, SCS, Walterboro, S. C. 1/21/64  
Mr. Lennie Coffield, Va. Supply & Well Co., Atlanta, Ga. 1/22/64  
Mr. J. C. Willis - County Agent, Chesterfield, S. C. 1/23;  
Mr. Thomas W. Jordan - Pageland, S. C. 1/23/64  
Mr. Jessie Demby - Pageland, S. C. 1/23/64  
Mr. Albert Jordan - Pageland, S. C. 1/23/64  
Mr. Howard L. Jordan - Pageland, S. C. 1/23/64  
Mr. Floyd Demby - Pageland, S. C. 1/23/64  
Mr. Lloyd Jordan - Pageland, S. C. 1/23/64  
Mr. Henry D. Pigg - Pageland, S. C. 1/23/64  
Mr. Cecil L. Jenkins - Pageland, S. C. 1/23/64  
Mr. Robert M. Jordan - Pageland, S. C. 1/23/64  
Mr. A. O. Funderburk - Jefferson, S. C. 1/23/64  
Mr. C. H. Hicks - Pageland, S. C. 1/23/64  
Mr. Boyd Evans - Pageland, S. C. 1/23/64  
Mr. Jack Evans - Pageland, S. C. 1/23/64  
Mr. Bobby Griffith - Chesterfield, S. C. 1/23/64  
Mr. Reese Jordan - Pageland, S. C. 1/23/64  
Mr. T. E. Smith - Jefferson, S. C. 1/23/64  
Mr. G. S. Catoe - Middendorf, S. C. 1/30/64  
Mr. J. W. Deierlein - Republic Const. Corp., Columbia, S. C. 1/30/64  
Mr. A. M. Yoger - Kean Const. Co., Columbia, S. C. 1/30/64  
Mr. John D. Findlay - Chief, Div. of Wildlife, Atlanta, Ga. 2/3/64  
Mr. Lawrence S. Givens - Reg. Supervisor, Atlanta, Ga. 2/3; 5/18 ; 5/19  
Mr. William Kean - Kean Const. Co., Columbia, S.C. 2/4;  
Mr. George B. Laney - Chesterfield, S. C. 2/4/64  
Mr. Charles Bolden - Sumter, S. C. 2/5/64

Mr. Mercer Brown - Dr. of Engineering, Atlanta, Ga. 2/7/64; 4/8/64  
 Mr. Billy F. Horton - Regional Engineer, Atlanta, Ga. 2/10/64  
 Mr. Ieland H. Barrineau - Property Mgt. Officer, Atla., Ga. 2/10/64  
 Mr. William A. Reid - Atlanta, Ga. 2/10/64; 3/17 8/12  
 Mr. F. J. Norton - FBI, Florence, S. C. 2/28/64  
 Mr. Albert E. Sanders - Columbia Science Museum, Columbia, S.C. 3/13/64  
 Mr. Ken Marek - Atlanta, Ga. 3/17  
 Mr. B. T. Daly - Columbia, S. C. 3/17/64  
 Mr. Hugh W. Clarkson - USGS, Arlington, Va. 4/6/64  
 Mr. Fred Abbott - Seaboard Airline R/R, Jacksonville, Fla. 4/9/64  
 Mr. H. P. Warlick - Seaboard Airline R/R, Jacksonville, Fla. 4/9/64  
 Mr. J. Claude Epting - Seaboard Air Line R/R, Hamlet, S. C. 4/9/64  
 Mr. H. S. Dooser, Sumter, S. C. 2/11/64  
 Mr. R. M. Talley, Sumter, S. C. 2/11/64  
 Mr. J. L. Humphrey, Sumter, S. C. 2/11/64  
 Mr. M. G. Hannon - Republic Const. Co., Columbia, S.C. 2/11/64  
 Mr. T. B. Blackman - Republic Const. Co., Columbia, S.C. 2/11/64  
 Mr. A. S. Bonders - Gulf Oil Corp., Charlotte, N. C. 2/11/64  
 Mr. H. L. Belyn Jr. - D.A. Lubricant Co., Columbia, S.C. 2/12/64  
 Mr. Clyde C. Rice - S. C. Forestry Comm., Patrick, S. C. 2/19/64  
 Mr. Joe Mauck - Hartsville, S. C. 2/19/64  
 Mr. Cland Denton - Adm. Assistant, Atlanta, Ga. 2/19/64  
 Mr. James A. Taylor - Gen. Engineer, Atlanta, Ga. 2/20; 5/26; 6/19; 8/6  
 Mr. Wilford K. Thurber - Budget & Accounting, Atlanta, Ga. 2/25/64  
 Mr. Tommy Cave, Columbia, S. C. 2/26/64  
 Miss Doris S. Lester, Hartsville, S. C. 2/27/64  
 Miss Lois Ousley, Hartsville, S. C. 2/27/64  
 Mr. Cecil P. Squires - Gen. Engineer, Atlanta, Ga. 4/21/64  
 Mr. Th. Green - SCS, Chesterfield, S. C. 4/27/64  
 Mr. F. F. Lesene, SCS, Chesterfield, S. C. 4/27/64  
 Mr. C. M. Ellerbe - SCS, Chesterfield, S. C. 4/27/64  
 Mr. John C. Mietze - SCS, Chesterfield, S. C. 4/27/64  
 Mr. C. Lawrence - SCS, Chesterfield, S. C. 4/27/64  
 Mr. George E. Smith Jr. - SCS, Chesterfield, S. C. 4/27/64  
 Mr. Louis E. Aull - SCS, Chesterfield, S. C. 4/27/64  
 Mr. Paul M. Lowry Sr., - Gen. Engineer, Atlanta, Ga. 5/12/64  
 Mr. Robert W. Young - Appraiser, Atlanta, Ga. 5/14/64  
 Mr. Richard B. Lingman - Forester, Atlanta, Ga. 5/14/64  
 Mr. R. S. Futul - Camden, S. C. 5/15/64  
 Mr. Fred W. Horn - S. C. State Forestry Comm., Columbia, S.C. 5/19/64; 12/8  
 Mr. Rodger Hagwood - Director Sandhills State Forest, Patrick, S.C. 5/19/64  
 Mr. E. G. Piakans - S. C. State Forestry Comm., Columbia, S.C. 5/19/64  
 Mr. J. B. Tiller - State Forester, Columbia, S. C. 5/19/64  
 Mr. J. D. Mills - Forester, Sandhills State Forest, Patrick, S.C. 5/19/64  
 Mr. Robert Lines - Reg. Supervisor, Br. of Realty, Atlanta, Ga. 5/19/64  
 Mr. Paul B. Willis - Gulf Oil Corp., Charlotte, N.C. 5/21/64  
 Mr. Alex B. Montgomery - Asst. Reg. Supervisor, Fishery Mgt., Atlanta, Ga. 5/22/64  
 Mr. William T. Floyd - Ft. Jackson, S. C. 5/25/64  
 Mr. William C. Lehmann - U.S. Game Mgt. Agent, Charleston, S.C. 6/4/64  
 Mr. Henry P. Joyner - Gen. Engineer, Atlanta, Ga. 6/16/64  
 Mr. Grady L. Hammon, Orangeburg, S. C. 6/22/64  
 Mr. Jerry Roberts, Manning, S. C. 6/26/64  
 Mr. Dean Carson - S. C. State Forestry Comm., Columbia, S. C. 7/1/64  
 Mr. Pete Spearman - Sandhills State Forest, Patrick, S. C. 7/1/64  
 Mr. Richard M. Smith - Sandhills State Forest, Patrick, S. C. 8/4/64

Mr. G. Rice - Sandhills State Forest, Patrick, S. C. 8/11/64  
 Mr. James O. Morphis Dr., Hartsville, S. C. 8/12/64  
 Mr. William C. Ashe - Asst. Reg. Supervisor, Realty, Atlanta, Ga. 8/12/64  
 Mr. Fred Downs - Cobutta, NVH, Cobutta, Ga., 8/17/64  
 Mr. Donald J. Hankla - Wildlife Mgt. Biologist, Br. of Refuges, Atlanta, Ga. 8/20  
 Mr. Kenneth A. Maynard - Catahoula NW Refuge, Jonesville, La. 8/31/64  
 Mr. Dick Smith - Predator & Rodent Control, Columbia, S. C. 9/1/64  
 Mr. Joe Knight - Ga. Game & Fish Comm., Atlanta, Ga. 9/17/64  
 Major Dillinger - U. S. Army, Ft. Jackson, S. C. 9/18/64  
 Mr. Keith M. McCartney - Cape Romain NWR, McClellanville, S.C. 9/23/64  
 Mr. Roy S. Futrell - U. S. Army, Columbia, S. C. 9/22/64  
 Mr. Edwin W. Ball - Pilot Biologist, Atlanta, Ga. 9/23/64  
 Mr. Robert T. Webb - Reg. Supervisor, Br. of Fishery Mgt., Atlanta, Ga. 10/1/64  
 Mr. Ridley D. Duncan - U. S. Game Mgt. Agent, Columbia, S.C. 10/5/64  
 Mr. Dick Gerthell - Asst. Reg. Supervisor, Br. of Realty, Atlanta, Ga. 10/5/64  
 Mr. Charles S. Cook - Gen. Engineer, Atlanta, Ga. 11/9/64  
 Mr. & Mrs. Joe Morwood, Charlotte, N. C. 11/11/64  
 Mr. Frank Johnson - Cape Romain NW Refuge, McClellanville, S.C. 11/12/64  
 Mr. Sumner A. Dew - East Coast Biologist, Hardeeville, S.C. 11/18/64; 9/23/64  
 Mr. Viator Johnson - General Services Adm., Ft. Bragg, N. C. 11/18/64  
 Mr. Paul W. Conner - Genst. Repres., Atlanta, Ga. 11/19/64  
 Captain Fred Spencer - U. S. Army, Ft. Jackson, S. C. 12/29/64

#### C. REFUGE PARTICIPATION:

In a conservation planning meeting on January 21 the refuge staff was host to members of the Soil Conservation Service. In attendance were Jim Lankford and Verlen Carter of the Regional Office, Mr. Jesse A Jordan - State Soil Conservationist, Mr. William Neely - SCS biologist, J. L. Wilson - area Conservationist, and Purvis Bedenbaugh Jr., representing the S. C. S. Chesterfield District. The purpose of the meeting was to discuss soils and capability mapping on refuge lands and to make tentative plans for further cooperative long range conservation planning.

On May 19 members of South Carolina Commission of Forestry and Bureau personnel met at refuge headquarters to discuss joint management plans and associated problems for the Fiscal Year 1965. Representing the Commission were State Forester John Tiller, Asst. State Forester E. C. Pickens, Management Forester Fred Horn, Sandhills State Forest Director Roger Hagwood and Project Forester Joe Mills. Representing the Bureau were Messrs. Lines, Givens and Carter of the Regional Office and Messrs. Holland, Stewart, and Cunningham of the refuge staff.

On July 15 a 3 agency meeting was held at Refuge headquarters to effect plans for woodlands conservation planning. Members of the S. C. Commission of Forestry, the Soil Conservation Service and the Bureau held a "round table" conference in the morning and went to the field in the afternoon to review and discuss specific problems to all concern.

Messrs. Cunningham and Stewart hosted 16 Junior Conservation Campers and their camp officials on June 10. The group, sponsored by the Garden Clubs of South Carolina spends a week at the Charaw State Park every summer and a tour of the refuge is included in the program to acquaint the youngsters with

the conservation policies and practices of the Branch of Wildlife Refuge.

On April 2 Mr. Cunningham met with the Soil Conservation District supervisors at a dinner meeting in Chesterfield. As a result of this endeavor the District entered into a Memorandum of Agreement with the Bureau.

On September 14 the Assistant Manager presented a slide talk to 22 ladies of the McBee Garden Club. The subject of discussion was the role of the individual refuge in the refuge system.

#### D. HUNTING:

The second annual controlled deer hunt was held on the refuge from October 5 to October 17. A total of 1193 permits were issued and 295 individuals participated, each hunting 20.44 hours for a combined total of 905 hunter days. Hunter success was 13% for those participating with 35 bucks checked out at refuge headquarters and at least 7 does found dead in the field. The 1963 hunt yielded 20 bucks and 2 does - hunter success was 7%. The average weight of the 35 animals checked out was 138 lbs with a range from 90 lb yearlings to a 221 lb 12 pointer. A 6 hour driving period was permitted during the middle of the day with the early and late hours reserved for still hunters. The arrangement proved satisfactory and reactions from most all participants were favorable. No accidents were reported, no wild fires were released and only 4 cases of violations were made - all trespass.

Organized hunting on the State Forest side of the area was liberalized for the 1964 season. Seasonal permits were issued for quail and squirrels while Wednesday and Saturday hunts were held for doves during the first of a split season, September 14 through October 10. Two thirds of the 977 dove hunt permits were issued to residents of Richland, Kershaw, and Lexington counties some 70, 40 and 80 miles respectively from the shooting areas. The 191 squirrel hunt permits were issued primarily to county residents but the composition of 112 quail hunters was some 40% local and 60% from various counties around the state with several participants coming from out of state. Public reaction to these organized hunts has been most favorable with participation increasing more than 600% over a 4 year period.

#### E. VIOLATIONS:

The following violations and respective dispositions were filed during the year:

<u>DATE</u>	<u>VIOLATOR</u>	<u>ADDRESS</u>	<u>VIOLATION</u>	<u>DISPOSITION</u>	<u>WHERE DISPOSED</u>
9/16	James M. Jackson	General Del. Lugoff, S.C.	Shooting over limit of doves	Fined \$17.00	Magistrate's Court, McBee, S. C.
10/10	Everette Collins	Rt. 5 Darlington, S. C.	Trespass	Fined \$25	Magistrate's Court, McBee, S.C.



<u>DATE</u>	<u>VIOLATOR</u>	<u>ADDRESS</u>	<u>VIOLATION</u>	<u>DISPOSITION</u>	<u>WHERE DISPOSED</u>
10/10	LeRoy Sweat	Rt. 3 Darlington, S. C.	Trespass	Fined \$25	Magistrate's Court, McBee, S. C.
10/13	William C. Rollings	Rt. 1 Jefferson, S. C.	Trespass	Fined \$10	Magistrate's Court, McBee, S. C.
10/13	Walter Donahue	PO Box 217 Jefferson, S. C.	Trespass	Fined \$10	Magistrate's Court, McBee, S. C.
12/5	Roy L. Lynch	1415 Barefoot, Hartsville, S. C.	Transporting firearms on a M/W Refuge	Fined \$100	Magistrate's Court, McBee, S. C.

#### F. SAFETY:

Sandhills is proud of it's safety record for 1964, only 2 minor accidents - an insect sting and a cut hand - were the only accidents sustained.

During the year 12 regular monthly safety meetings and one special safety meeting were held. The safety committee, Messrs. Cunningham, Stewart and Rogers held 6 meetings after the organization of the Committee in May.

A multitude of safety topics were discussed throughout the period including fire, lightning, lifting, equipment operation, boating, motor vehicle operation, use of hand tools, electricity, and dozens more. Several pieces of refuge equipment were "safetyized" and road signs were installed to enhance the refuge safety program. Sandhills has logged more than 37,000 hours since the last lost time accident!

#### VII OTHER ITEMS

##### A. ITEMS OF INTEREST:

On July 29 Sandhills was delegated administrative authority for the Pee Dee refuge in Anson and Richmond counties in south-central North Carolina, 40 air miles north of our area. Thus far, purchase agreements have been executed on more than 1100 acres with several transactions for more lands near completion. Refuge personnel, working with Soil Conservationist Lankford, have negotiated farm agreements on some 200 acres of the area for 1965. It is anticipated that another 150 acres will be rented for farming in the early spring. Plans have been made to post the area in the immediate future.

Clerk Mark A. Brown and maintenancesman Olin Morrison are participating in a 2 month evening study course in air cooled engines, sponsored by the U. S. D. A. at McBee High School.

**B. PHOTOGRAPHS:**

A summary of the 1964 management year is illustrated in the following photographs:



**ERNEST F. HOLLAND,  
Refuge Manager.**

**SUBMITTED: January 22, 1965.**

**APPROVED:**

*(Signature)*

Regional Refuge Supervisor

JAN 23 1965



In February a group of Hartsville High School science teachers visited the refuge. Here, they observe Canada geese on Ox Pen Lake. No. 1



On July 15 members of the Soil Conservation Service, the S. C. Forestry Commission and the Bureau met to discuss conservation problems of mutual interest to refuge and State Forest management personnel. No. 2



921 acres of refuge land were rented to watermelon growers in 1964 and



despite consistent "wildlife" depredations..... No. 3



growers produced more than 5,000 tons of melons. No. 4





Each year the refuge farm plan calls for sodding of critical slopes to prevent erosion and in this case, prevent encroachment of trees in the Oak Pen waterfowl area. No. 5



Two dump trucks, picked up as surplus property during the APW program, are utilized for road and dike repair. No. 6





This 2 acre clearing was prepared in late August for equipment storage in a wooded area 250 yards north of the refuge office. No. 7



A Pageland, S. C. hunting club which hunted collectively and killed these 3 nice bucks on a drive during the refuge hunt on Oct. 13. These 3 animals weighed, in aggregate, 529 lbs and boasted 39 points. No. 8





Forty six (46) wood duck nest boxes were erected during the period; 26 metal boxes (above, No. 9) were fabricated by a local sheet metal shop at a cost of \$7 each, and 20 wooden boxes (below, No. 10) were constructed by refuge personnel at a unit cost of \$3.50.



Contracts were let in January for the construction of 19.5 miles of roads through the interior of the refuge and...



the road machines moved into the area in February. Here (No. 11) the fill is laid over the water control structure on Lightwood log Branch.



In June, 8.5 miles of the main artery of the system (road #1) were paved, shoulders and slopes were sodded. This is a view from the opposite side of Lightwood Log Branch fill which will impound 15 acres of water. No. 12





Road work complete. This fill on Ham Branch at the head of Martin Lake impounds 29 acres of water which will be managed as a green-tree reservoir.  
No. 13



A flash flood in 1957 washed out the spillway of 14 acre Lake Bee. As a part of the forest recreation phase of the Accelerated Public Works program begun in 1963, the spillway was renovated in mid-summer of 1964.  
No. 14





The bed of Lake Bee, fallow since 1957 has been the scene of much ecological activity. Numerous plants, both herbaceous and woody, have encroached upon the site. No. 15



The spillway complete, in addition to its functional purpose, is a welcome and beautiful sight to travelers along State highway 145. No. 16





The water was raised in Lake Bee in early October. An integral part of the Lake Bee Recreation area (background), the lake will be opened to boating in 1965..... No. 17



and fishing in 1966. (Lake was stocked with Blue gill and red-eared sunfish in late October, channel catfish in early November.) No. 18



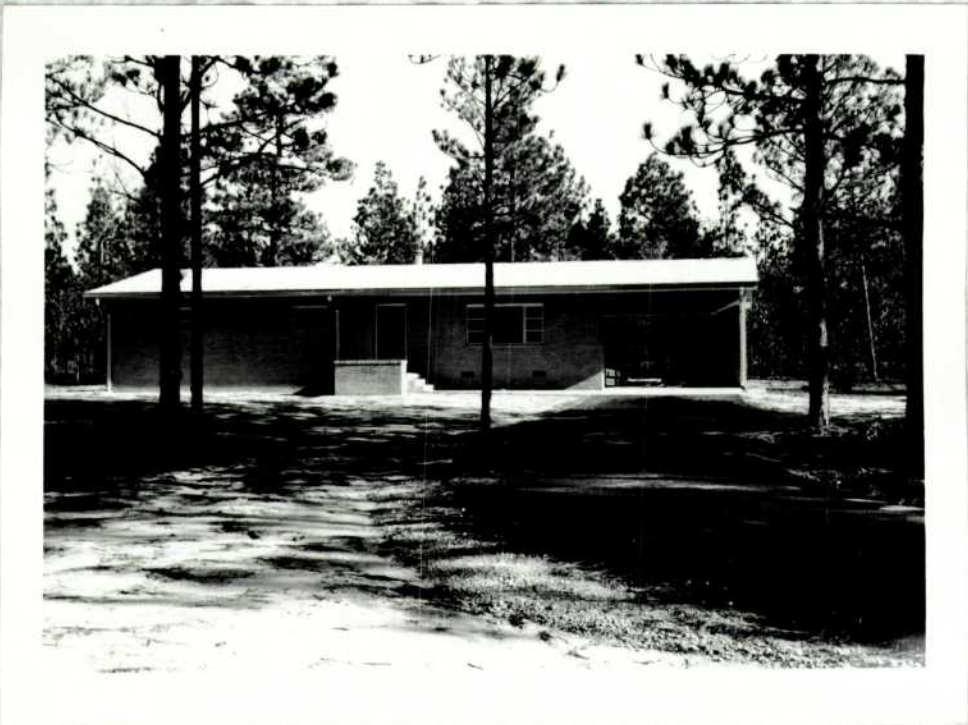


Completed also in 1964 were other facilities in the Lake Bee Recreation Area. The picnic area now contains two modern toilets (above).... No. 19



three picnic shelters, 34 tables, 26 stoves, a fresh-water well, a boat ramp, and..... No. 20





A new residence - ready and waiting for a recreationist. Unfortunately, personnel and financial ceilings may keep it empty for some time yet!  
No. 21

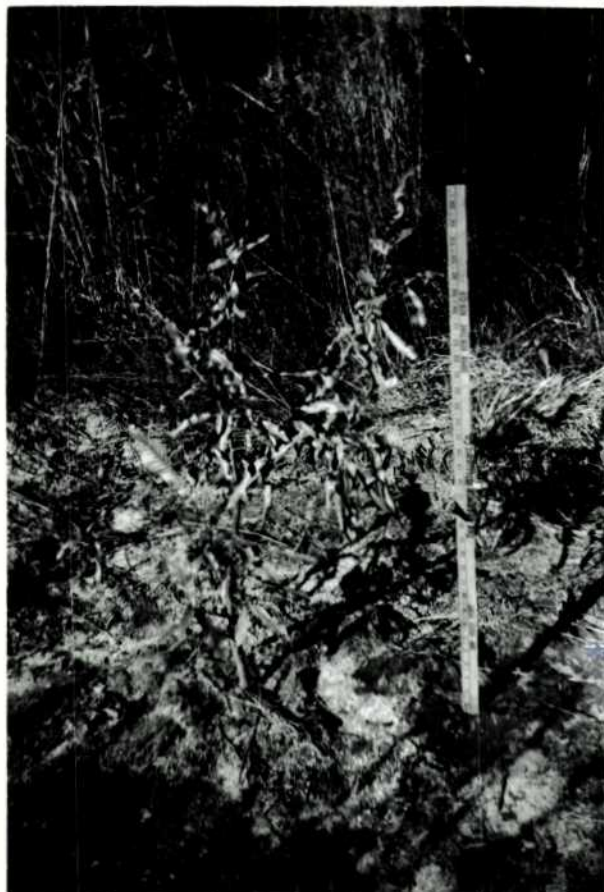




• DEC • 64

These Live Oak (Quercus virginiana) seedlings are one year old. Plans are to transplant approximately 10,000 of these seedlings from our nursery during the winter of 1963. No. 22

This Sawtooth Oak (Quercus acutissima) seedlings is two years old. One of 286, it was transplanted from our nursery to an abandoned field at one year of age. No. 23



69 • DEC • 64





DEC • 64

The above photo shows a control burn being carried out in a Longleaf pine (Pinus palustris) stand. No. 24



• DEC • 64

Deer browse on sprout growth of Red Maple (Acer rubrum) as a result of a control burn made in January of 1964. No. 25





Control burn study plot No. 32 prior to a control burn. No. 26



Control burn study plot No. 15 following a control burn made in January 1964. Both pictures were taken in June 1964. The site index for both areas ranges between 60 and 65. No. 27



W A T E R F O W L

REFUGE Caroline Sandhills National Wildlife Refuge

MONTHS OF January TO April, 1964

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
<b>Swans:</b>										
Whistling Trumpeter										
<b>Geese:</b>										
Canada	900	900	900	900	900	900	900	900	900	550
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
<b>Ducks:</b>										
Mallard	1100	1100	1100	1100	1100	1100	900	200	100	12
Black	800	800	800	800	800	800	350	100	50	
Gadwall										
Baldpate	2	2	2	2	12	12	12	25	15	30
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood	75	75	75	75	75	75	75	75	50	20
Redhead										
Ring-necked	25	25	25	25	25	25	50	40	12	25
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<b>Hooded Merganser</b>	15	15	15	15	15	15	15			
<b>Coot:</b>										

3 -1750a

Cont. NR-1  
(Rev. March 1953)WATERFOWL  
(Continuation Sheet)REFUGE Carolina Sandhills National Wildlife RefugeMONTHS OF January TO April, 19 64

(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			
<b>Swans:</b>											
Whistling											
Trumpeter											
<b>Geese:</b>											
Canada	190	12							61,964		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
<b>Ducks:</b>											
Mallard	6								51,926		
Black									37,100		
Gadwall											
Baldpate	25								973		
Pintail											
Green-winged teal											
Blue-winged teal		10							70		
Cinnamon teal											
Shoveler											
Wood	25	30	20	20	20	20	20	20	5,915	0	40
Redhead											
Ring-necked	25								2,114		
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
<b>Hooded Merganser</b>		5							770		
<b>Coot:</b>											

(over)

	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans			
Geese	61,964	900	0
Ducks	98,868	2,027	40
Coots			

SUMMARY	
Principal feeding areas	Martin and Ox Pen Lakes
Principal nesting areas	Martin, Triple Lakes and Lake 16

Reported by EARL R. CUNNINGHAM, Assistant 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).

W A T E R F O W L

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF May TO August, 19 64

(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	30	30	30
Redhead										
Ring-necked	1	1								
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<u>Coot:</u>										
	2	2								

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

WATERFOWL  
 (Continuation Sheet)

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF May TO August, 1964

(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											
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	40	40	40	40	40	40	40	3,850	3	20
Redhead											
Ring-necked											
Canvasback									14		
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
<u>Coot:</u>									28		

(over)

	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans			
Geese			
Ducks	3854	41	20
Coots	28	2	0

SUMMARY	
Principal feeding areas	Martin Lake
Principal nesting areas	Martin & Triple Lakes

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

EARL R. CUNNINGHAM, Asst. 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).

W A T E R F O W L

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF September TO December, 19 64.

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
<u>Swans:</u>										
Whistling Trumpeter					31	94	170	340	340	430
<u>Geese:</u>										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
<u>Ducks:</u>										
Mallard						10	45	50	50	100
Black						15	30	40	40	65
Gadwall										
Baldpate									4	
Pintail										
Green-winged teal										
Blue-winged teal	60			100	12	8			12	
Cinnamon teal										
Shoveler					8	3				
Wood	40	30	75	75	90	50	50	75	75	100
Redhead										
Ring-necked								10	10	
Canvasback										
Scaup										
Goldeneye										
Bufflehead										1
Ruddy										
Other										

Coot:

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

WATERFOWL  
 (Continuation Sheet)

REFUGE ~~Carolina Sandhills National Wildlife Refuge~~

MONTHS OF September TO December, 1964

(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		
<b>Swans:</b>										
Whistling Trumpeter										
<b>Geese:</b>										
Canada	450	450	470	570	690	920	1000	1030	49,725	
Cackling Brant										
White-fronted Snow										
Blue Other										
<b>Ducks:</b>										
Mallard	75	300	400	400	1100	1000	1300	1300	44,950	
Black Gadwall	75	200	250	250	700	800	900	900	29,055	
Baldpate Pintail		10	25	25	25	75	100	100	1,940	
Green-winged teal										
Blue-winged teal									1,344	
Cinnamon teal										
Shoveler									77	
Wood Redhead	100	100	125	125	200	170	200	200	15,160	
Ring-necked Canvasback		170	200	200	30		25	25	4,690	
Scaup Goldeneye										
Bufflehead										
Ruddy										7
Other										7
<del>Old-Squaw</del> Hooded Merganser			10	10			25	25	25	665
<b>Coot:</b>										

(over)



	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans			
Geese	49,725	1050	
Ducks	96,070	2550	
Coots			

SUMMARY

Principal feeding areas ~~Martin Lake and Or Fox Lake~~

Principal nesting areas ~~Martin Lake~~

Reported by

*Carl R. Cunningham*  
 CARL R. CUNNINGHAM, Asst. 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  
(Aug. 1952)

MIGRATORY BIRDS  
(Other than Waterfowl)

Refuge Carolina Sandhills N/W Refuge

Months of January

to April

19 64.

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total	
	Common Name	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>											
Great Blue Heron	1	April	2	April	2	April					2
Green Heron	2	March	4	April	4	April					2
Pied Billed Grebe	1	March	2	April	1	April					2
II. <u>Shorebirds, Gulls, and Terns:</u>											
Spotted sandpiper	6	March	50	April	50	April					50

(over)

	(1)	(2)	(3)	(4)	(5)	(6)			
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	3000	Jan.	3000	Jan.	1000	April	500	1000	2000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	500	Jan.	1500	April	1500	April	200	500	1500

Reported by EARL R. CUNDINGHAM, Asst. Ref. Manager

INSTRUCTIONS

(See Sec. 7532, Wildlife Refuges Field Manual)

- (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 migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

3-1751  
Form NR-1A  
(Aug. 1952)

MIGRATORY BIRDS  
(Other than Waterfowl)

Refuge Carolina Sandhills N/W Refuge Months of May to August 19 64

(1) Species Common Name	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>										
Little Blue Heron	4	July 12	24	Aug 1-15	15	Aug 15				1500
American Egrets	6	July 11	20	Aug 8-14	5	Aug 18				1400
Pied Bill Grebes	2	Aug	6	Aug	6	Aug				500
Great Blue Heron	1	June	6	July	2	Aug				400
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	1500	May	4500	August	4500	August	700	3000	400,000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	500	May	1000	July	1000	August	200	400	80,000

Reported by Earl R. Cunningham, Asst. Ref.

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual) <sup>Wgr.</sup>

- (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 migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

3-1751  
Form NR-1A  
(Aug. 1952)

MIGRATORY BIRDS  
(Other than Waterfowl)

Refuge Caroline Sandhills National Wildlife Months of September to December 1964.

(1) Species Common Name	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>										
Pied Bill Grebe	6	Aug.	12	Oct.	6	Dec.				700
Great Blue Heron	2	Aug.	4	Aug.	2	Oct.				20
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	4500	Sept. 1	4500	Sept. 1-15	2500	Dec.	337,500
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	1000	Sept. 1	2000	Sept.	1500	Dec.	195,000

Reported by *Earl R. Cunningham*  
EARL R. CUNNINGHAM, Asst. Ref. Mgr.

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (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 migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

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 Carolina Sandhills Wt For 12-month period ending August 31, 19 64.

Reported by Earl R. Cunningham Title Assistant Refuge Manager.

(1) Area or Unit Designation	(2) Habitat			(3) Use-days	(4) Breeding Population	(5) Production
	Type	Acreage				
<b>NORTHERN ZONE</b>	Crops	<u>0</u>	Ducks	<u>500</u>	<u>2</u>	<u>0</u>
	Upland	<u>12,090</u>	Geese			
	Marsh		Swans			
	Water	<u>80</u>	Coots			
	Total	<u>12,170</u>	Total	<u>500</u>	<u>2</u>	<u>0</u>
<b>CENTRAL ZONE</b>	Crops	<u>1055</u>	Ducks	<u>170,000</u>	<u>14</u>	<u>18</u>
	Upland	<u>19665</u>	Geese	<u>99,335</u>		
	Marsh		Swans			
	Water	<u>190</u>	Coots	<u>50</u>		
	Total	<u>20,870</u>	Total	<u>269,385</u>	<u>14</u>	<u>18</u>
<b>SOUTHERN ZONE</b>	Crops	<u>136</u>	Ducks	<u>5,944</u>	<u>4</u>	<u>2</u>
	Upland	<u>11,741</u>	Geese			
	Marsh		Swans			
	Water	<u>10</u>	Coots			
	Total	<u>11,887</u>	Total	<u>5,944</u>	<u>4</u>	<u>2</u>
<b>TOTAL</b>	Crops	<u>44,927</u>	Ducks	<u>275,829</u>	<u>20</u>	<u>20</u>
	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 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

Refuge ~~Carolina Sandhills N/W Refuge~~ Months of ~~January~~ to ~~April~~, 19 ~~64~~.

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
			Number broods obs'v'd.	Estimated Total		Hunting	For Re- stocking	For Research		
Common Name	Cover types, total acreage of habitat	Acres per Bird			Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob white quail	44,000	44	0	0	55M 45F				1000	
Eastern Wild turkey	44,000	700	0	0	65M 35F				65	The turkey population seems to be steadily declining. Less than a half dozen hen turkey observations were recorded for the period - none with 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.

3-1752  
Form NR-2  
(April 1946)

UPLAND GAME BIRDS

Refuge Carolina Sandhills NW

Months of May to August, 19 66.

(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	no. broods obs'v'd.	Estimat- ed Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
<b>Wild Turkey</b>	<b>40,000</b>	<b>900</b>	<b>1</b>	<b>30</b>	<b>60/40</b> <b>M F</b>	<b>NONE</b>			<b>80</b>	
<b>Bob-white quail</b>	<b>40,000</b>	<b>13</b>	<b>20</b>	<b>1800</b>	<b>90/10</b> <b>M F</b>	<b>NONE</b>			<b>3000</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.

3-1752  
Form NR-2  
(April 1946)

UPLAND GAME BIRDS

Refuge Carrollton Sandhills National Wildlife

Months of September to December, 1964.

(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	No. broods obs'v'd.	Estimat- ed Total		Hunting	For Re- stocking	For Research		
Common Name					Percentage					Pertinent information not specifically requested. List introductions here.
Wild Turkey	40,000	535			60M/40F				75	
Bob-white quail	40,000	13			50M/50F				3000	

## 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 1966

(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	
White tailed deer	45,000	600	250					300*			1800	1200	100/600

Remarks:

\* Egress from refuge as result of massive land clearing program.

Reported by *Earl R. Cunningham*  
EARL R. CUNNINGHAM, Asst. Ref. Manager.



## 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.

3-1754  
Form NR-4  
(June 1945)

SMALL MAMMALS

Refuge Carolina Sandhills N/W Refuge Year ending April 30, 1964.

(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	44,000	30			5									1450
Beaver	4,000	13												300
Mink	4,000	200												20
Otter	4,000	100												40
Muskrat	4,000	200												20
Opossum	44,000	220												200
Skunk(Stripped)	44,000	150												300
Gray squirrel	44,000	100												440
Fox squirrel	44,000	50												875
Gray fox	44,000	175			1									250
Red fox	44,000	200												220
Bob cat	44,000	220												200

\* List removals by Predator Animal Hunter

REMARKS:

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

## 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 unprinceness 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 Carolina Sandhills National Wildlife

Year ~~196~~ 1964

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 Nothing to report

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

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

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

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

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

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

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

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

Remarks Nothing to report

## PUBLIC RELATIONS

(See Instructions on Reverse Side)

Refuge Carolina Sandhills National WildlifeCalendar Year 1964

## I. Visits

a. Hunting 905 b. Fishing 1000 c. Miscellaneous 19,100 d. TOTAL VISITS 12,005

## 1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl			
Upland Game *	<u>3030</u>	<u>45000</u>	<u>S.C. Commission of Forestry</u>
Big Game	<u>905</u>	<u>45000</u>	<u>Refuge Forestry</u>
Other (Doves)*	<u>577</u>	<u>45000</u>	<u>S.C. Commission of Forestry</u>

Number of permanent blinds \_\_\_\_\_

Man-days of bow hunting included above \_\_\_\_\_

Estimated man-days of hunting on lands adjacent to  
refuge 8,000

## 1b. Fishing (area open to fishing on refuge lands)

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	<u>50</u>	
Streams and Shores		

## 1c. Miscellaneous Visits

Recreation 2000 Official 100  
Economic Use 8000 Industrial \_\_\_\_\_

## 2. Refuge Participation (groups)

TYPE OF ORGANIZATION	On Refuge		Off Refuge	
	NO. OF GROUPS	NUMBER IN GROUPS	NO. OF GROUPS	NUMBER IN GROUPS
Sportsmen Clubs				
Bird and Garden Clubs	<u>1</u>	<u>28</u>		
Schools				
Service Clubs				
Youth Groups	<u>1</u>	<u>26</u>		
Professional-Scientific	<u>2</u>	<u>11</u>		
Religious Groups				
State or Federal Govt.	<u>3</u>	<u>20</u>	<u>1</u>	<u>6</u>
Other				

## 3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases		Radio Presentations	
Newspapers (P.R.'s sent to)	<u>3</u>	Exhibits	
TV Presentations	<u>108</u>	Est. Exhibit Viewers	

## INSTRUCTIONS

Item 1: Total of a, b, and c, equal d.

"Visit" - definition. Any person who is on refuge lands or waters during a day or part thereof for the purpose of: hunting, fishing, bird-watching, recreation, business or economic use, official visit, or similar interest. INCLUDE - those who stop within the refuge while traveling on a public highway because of an interest in the area. EXCLUDE - persons engaged in oil or other industry not directly related to the refuge, persons using refuge as most direct route or principal avenue of traffic, and those boating on navigable rivers or the Intercoastal Canal, unless they stop to observe wildlife on the refuge.

Computing visits. Where actual counts are impractical, "sampling" is used with midweek and weekend samples varied by season or weather. A conversion factor of 3.5 (of passengers per car) is used when accurate figures are not available. Each refuge will develop a conversion factor for boats based on range of usage. Count a camper once for each 2<sup>1</sup>/<sub>2</sub>-hour period or fraction thereof.

Item 1a: Acres - of refuge open for each type of hunting.

Managed hunts require check in and out of hunters, issuance of permits, or assignment of blinds.

Other - INCLUDE crow, fox, and similar hunting.

Lands adjacent to refuge. Normally considered within 1 mile or less of boundary, unless established sampling procedures cover a wider area. For big game hunting, the distance may be greater.

Item 1b: Acres of streams open to fishing, if practical; otherwise just miles open. Information on "shores" is primarily for coastal fishing.

Item 1c: Recreation. INCLUDE photography, observing wildlife, picnicking, swimming, boating, camping, visitor center use, tours, etc. TOTAL Recreation, Official, and Economic Use visits under Item 1.

Industrial. INCLUDE persons engaged in industry, i.e., oil industry or factories. EXCLUDE these from Item 1.

Item 2: INCLUDE the "On Refuge" groups in Items 1c and 1. In "Off Refuge" column include only those group meetings in which refuge employees actually participate. EXCLUDE these from Items 1c and 1.

Item 3: Exhibits - INCLUDE displays, fairs, parades, and exhibits OFF the refuge; EXCLUDE those ON.

Refuge Carolina Sandhills National Wildlife Calendar Year 1964

Facilities

Picnic areas: • areas 1 tables 34 fireplaces 27 toilets 2  
drinking water 3 shelters 3

Swimming: designated areas \_\_\_\_\_ bathhouses \_\_\_\_\_

Boating: launching sites 1 rental facilities \_\_\_\_\_  
service facilities \_\_\_\_\_  
are motors allowed no maximum horsepower \_\_\_\_\_

Camping: • permitted Yes or not permitted \_\_\_\_\_  
tent camps \_\_\_\_\_ total capacity 60 Acres  
group camps \_\_\_\_\_ total capacity \_\_\_\_\_  
hunter camps 1 total capacity \_\_\_\_\_  
trailer camps \_\_\_\_\_  
lodges \_\_\_\_\_ capacity \_\_\_\_\_  
cabins \_\_\_\_\_ motels \_\_\_\_\_ total units \_\_\_\_\_

Tours: • Season All frequency By appointment  
self-guided nature trails \_\_\_\_\_ is trail leaflet available? No  
self-guided auto tour route \_\_\_\_\_ is tour leaflet available? No

Access points: estimate number in public use 3

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

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 \*\*.



PLANTINGS  
(Marsh - Aquatic - Upland)

Refuge Carolina Sandhills National WildlifeYear 1971 1964.

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
Long Leaf Pine ( <u>Pinus palustris</u> )	Compartments 8, 9 & 10	1000 seedlings Ac.	2,000 Ac.	2,000,000	Jan, Feb, Nov, Dec.	80%		Planted by S.C. Commission of Forestry

## TOTAL ACREAGE PLANTED:

Marsh and aquatic \_\_\_\_\_  
 Hedgerows, cover patches \_\_\_\_\_  
 Food strips, food patches \_\_\_\_\_  
 Forest plantings 2000 Ac.

## REFUGE GRAIN REPORT

Refuge Carleton Suddalls National Wildlife

Months of January through December, 1964.

(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
Lespedeza bicolor	2290 lbs.		2290 lbs.		2290 lbs.		2290 lbs.	0			
Lespedeza sericea	880 lbs.		880 lbs.		880 lbs.		880 lbs.	0			
Lespedeza sericea (uncleaned)	189 lbs.	66 Bu.	97 Bu.		31 Bu.		31 Bu.	66 Bu.	66 Bu.		
Soybeans	12 Bu.		12 Bu.			12 Bu.	12 Bu.	0			
Fescue	100 lbs.		100 lbs.					100 lbs.	100 lbs.		
Wheat	1299 lbs.	235 Bu.	256 Bu.		23 Bu.	235 Bu.	256 Bu.	0			
Br. Top Millet	300 lbs.		300 lbs.			300 lbs.	300 lbs.	0			
Corn	230 Bu.		230 Bu.			130 Bu.	130 Bu.	100 Bu.			100 Bu.
Chufa	1833 lbs.		1833 lbs.			1833 lbs.	1833 lbs.	0			
Bahia Grass	2000 lbs.		2000 lbs.		2000 lbs.		2000 lbs.	0			
Rye Grass		2000 lbs.	2000 lbs.		2000 lbs.		2000 lbs.	0			
Secum		100 lbs.	100 lbs.		100 lbs.		100 lbs.	0			
Rye		14 Bu.	14 Bu.					14 Bu.	14 Bu.		
Lovegrass		150 lbs.	150 lbs.					150 lbs.	150 lbs.		

(8) Indicate shipping or collection points \_\_\_\_\_

(9) Grain is stored at Headquarters seed house and corn crib at Martin Lake.

(10) Remarks Some seed listed under "Fed" was damaged by insects - some had grown old, lost viability.

\*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.

## REFUGE GRAIN REPORT

Refuge Carolina Sandhills National Wildlife

Months of January through December, 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 OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
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Lespedeza sericea (uncleaned)	1896 lbs.	66 Bu.	97 Bu.		31 Bu.		31 Bu.	66 Bu.	66 Bu.		
Soybeans	12 Bu.		12 Bu.			12 Bu.	12 Bu.	0			
Fescue	100 lbs.		100 lbs.					100 lbs.	100 lbs.		
Wheat	1299 lbs.	235 Bu.	256 Bu.		23 Bu.	235 Bu.	256 Bu.	0			
Br. Top Millet	300 lbs.		300 lbs.			300 lbs.	300 lbs.	0			
Corn	230 Bu.		230 Bu.			130 Bu.	130 Bu.	100 Bu.			100 Bu.
Chufa	1833 lbs.		1833 lbs.			1833 lbs.	1833 lbs.	0			
Bahia Grass	2000 lbs.		2000 lbs.		2000 lbs.		2000 lbs.	0			
Rye Grass		2000 lbs.	2000 lbs.		2000 lbs.		2000 lbs.	0			
Secoam		100 lbs.	100 lbs.		100 lbs.		100 lbs.	0			
Rye		14 Bu.	14 Bu.					14 Bu.	14 Bu.		
Lovegrass		150 lbs.	150 lbs.					150 lbs.	150 lbs.		

(8) Indicate shipping or collection points \_\_\_\_\_

(9) Grain is stored at Headquarters seed box and corn crib at Martin Lake.

(10) Remarks Some seed listed under "Fed" was damaged by insects - some had grown old, lost viability.

\*See instructions on back.

## REFUGE GRAIN REPORT

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- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

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

Refuge Carolina Sandhills National Wildlife Year ~~195~~ 1964.

Species	Collections				Receipts		Total Amounts on Hand	Amount Surplus
	Amount	Date or Period or Collection	Method	Unit Cost	Amount	Source		
Wheat	235 Bu.	June 19	Refuge Harvest					
Rye		July 7			14 Bu.	Cooperator	14 Bu.	
Lespedeza sericea (unhulled)	66 Bu.	Dec. 8	Refuge Harvest				66 Bu.	

Refuge Carolina Sandhills National Wildlife Year 1941 1944.

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
<p>TIMBER REMOVED BY SOUTH CAROLINA COMMISSION OF FORESTRY                      SEE "FORESTRY" part D, RESOURCE MANAGEMENT, THIS REPORT</p>								

Total acreage cut over \_\_\_\_\_ Total income \_\_\_\_\_

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