

CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE

McHEE, SOUTH CAROLINA

NARRATIVE REPORT

January 1, 1969 - December 31, 1969

P E R S O N N E L

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ANNUAL REFUGE NARRATIVE REPORT  
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January-December, 1969

I. GENERAL

A. Weather Conditions:

The information in the table below was obtained from the weather station at Cheraw, South Carolina:

<u>Month</u>	<u>Precipitation</u>		<u>Temperature</u>	
	<u>1969</u>	<u>Normal</u>	<u>Maximum</u>	<u>Minimum</u>
January	2.20	3.36	69	11
February	7.24	3.47	67	18
March	3.90	4.14	76	20
April	5.83	3.84	83	32
May	3.81	3.36	93	38
June	4.25	4.09	97	54
July	9.74	5.62	101	64
August	5.98	5.35	93	53
September	5.31	4.26	89	47
October	4.32	2.68	84	29
November	1.38	2.80	73	19
December	<u>4.51</u>	<u>3.46</u>	<u>77</u>	<u>16</u>
TOTAL	58.47	46.43	101	11

As in 1968, the weather conditions were constantly changing. They were even more extreme than in 1968. Starting with the "Unbelievable" ice storm in February and ending with the dry period in October and November, 1969 was a year of unforgettable weather conditions. The total precipitation for the year was 12.04 inches more than normal but there were two periods, one in the spring and one in the fall, when this area became critically dry. This was due to a large amount of the precipitation falling during short periods of time. For example, there were 2 days with over 3 inches of rainfall, 6 days with more than 2 inches, and 9 days with more than 1 inch. This was a total of 30.63 inches or more than 50 percent of the total precipitation for the year. This was also a colder year than 1968 with March being the third coldest March on record. The highest temperature recorded was 101 degrees in July and the lowest was 11 degrees in January.

The first half of January was dry but there was adequate rainfall during the last half. January was a cold month with below freezing temperatures being recorded on 21 days.

February, 1969, will be a month that will be remembered for a long time by residents of this area. A severe weather disturbance pattern that extended from the Gulf to the Great Lakes brought snow, ice, heavy rains and winds to South Carolina. The northwest part of the State received record breaking snowfalls, but this area received very little snow. What it did receive was sleet and freezing rains. One local writer described this natural catastrophe as follows: "Raging through Chesterfield County like an angry god, the gleaming, silent, white monster snapped power poles, snatched down lines, up-rooted trees or ripped them apart, stripping limbs and strewing them across roads, atop dwellings, upon lawns and vehicles". This was probably the worst ice storm in the history of this area. Freezing rains, that started on February 15 and continued until early on the morning of February 17, caused ice to accumulate rapidly on all objects and literally tens of thousands of trees broke off or were up-rooted by the weight of the ice. Miles of powerlines and telephone lines fell due to the weight of the ice and from trees falling on them. The Carolina Power and Light Company estimated that more than 100,000 of their customers were without electricity. Damage estimates totaled over \$65 million, and at least 90 percent of the damage was to trees in the forested areas of Chesterfield and the surrounding 15 counties. Chesterfield County, including the Refuge, was by far the hardest hit area in South Carolina.

March was a dry month followed by April and May with above normal precipitation. In spite of the above normal precipitation for April and May, there was a critical dry spell from about April 25 until May 19. During this period there was only about .14 inches of precipitation. The danger of wild fires was high during this period but heavy rains during the last week in May relieved this situation. The heavy rains continued on through June, July and into August, with thunder storms in July and August. The heavy rains in June and July caused damage to roads, dikes, and fields. One small fire was started by lightning during one of the thunder storms in July. The last of September was dry followed by a dry month of October except for a 2 day period when 4.10 inches of rain fell. November was dry with only about one half the normal amount of rainfall. The precipitation during December was adequate with above normal rainfall.

#### B. Habitat Conditions:

##### 1. Water

The amount of precipitation for the year was 12.04 inches above normal with only 2 months recording less than normal precipitation. This area experienced heavy rains and thunder storms



during June and July. These heavy rains washed holes in roads, dikes and fields. With the above normal precipitation all streams on the Refuge ran freely and the lakes were supplied with abundant fresh water. Black Creek stayed fuller than at any time during the last few years. Impoundment E, that went dry during the summer drought of 1968, stayed full during 1969. All lake levels were maintained in accordance with the Annual Water Program.

## 2. Food and Cover:

The production of natural vegetation both aquatic and upland was very good. This good production was due to abundant rainfall during the growing season. There was an abundance of new tender growth for deer to browse on. This was partially due to the heavy rainfall and partially due to the ice storm which broke off plants that resprouted or put on new growth at the breaks. Excellent crops of native peas, tick trifol, smartweed, blue and black berries, grapes, and persimmons were produced. There were good crops of turkey and blackjack oak mast, green briar, and dogwood berries. Only a fair crop of post, water, red, and white oak mast was produced. There was a poor crop of plums and longleaf pine mast.

In 1969, fifteen impoundments were either completely dewatered or drawn down sufficiently to expose a belt of shoreline for summer production of plants. Good crops of aquatic plants that are valuable as waterfowl food were produced in the drawdown impoundments. No food volume production data were collected but line surveys were made by Otto Florschutz, Area Biologist, and Refuge personnel, to collect species production at four of the drawn down impoundments. Three of the impoundments had been drawn down for 3 successive years. Surveys were also made at these 3 impoundments in 1968. Of all plant species recorded at the four impoundments, 49.1 percent are known good to excellent waterfowl foods, 38.9 percent are known fair foods and 12.0 percent are known to have little value as waterfowl foods. The 1968 percentages were 34.3, 54.6, and 11.1, respectively, which seems to indicate that more good waterfowl food plants are produced in those impoundments that are drawn down for more than one year in succession. Warty panicum and fall panicum made up 38.1 percent of the plant life following drawdown. Some of the other plants recorded were spikes rushes, pondweed, wild millet, and smartweed. The surveys made in 1968 and 1969 not only indicated that more desirable aquatics are produced by lowering the water level in impoundments during the growing season but undesirable aquatics like bladderwort and watermilfoil can be nearly eliminated or at least discouraged for a few years.

## II. WILDLIFE

### A. Migratory Birds:

The first migrating Canada geese arrived at the Refuge on September 9. The 1969 fall flight is running behind the 1968 fall flight. The goose flock reached a peak of 1,602 birds in January, 1969. The Refuge flock has been increasing since 1963 when a low of 800 birds were reported. In the 1968 fall flight, there were two blue geese, but they did not return with the 1969 flight.

In May, three mated pairs of Canada geese along with their 14 young were obtained from the Savannah National Wildlife Refuge. They were released at Martins Lake in hopes that they will establish a resident breeding flock in the wild. The two smallest of the young geese disappeared in the first 2 days after they were released on the Refuge, but the others all stayed healthy and were as big as their parents at the end of the year.

The duck population continues to increase both in wintering and breeding birds. The number of ducks using the refuge in 1969 increased approximately 60 percent over the number in 1968. Since 1965 there has been an increase of 150 percent. Most of the increase has been in mallards, black ducks and wood ducks. Probably the most important reason for the tremendous increase in ducks on the refuge since 1965 was the construction of 11 new wooded impoundments in 1963-64. Also, part of the increase could be due to more emphases being placed on counting the birds. In the past 2 years we have worked hard on trying to improve the census methods used on the refuge. Another reason could be the increase in production of desirable aquatics as a result of drawing down the impoundments during the growing season.

The production of wood ducks continues to increase, especially, in the nesting boxes. Out of the 120 boxes available in 1969, there were 73 nesting attempts, with 62 successful nests. The 62 successful nests were a high for the Refuge as compared to 44 in 1968 and 27 in 1967. One interesting aspect was that the use of metal boxes jumped from less than 25 percent in 1968 to 82 percent in 1969. The first brood of young wood ducks were seen on April 14, which was about the same time the first brood was seen in 1968. At least one brood was observed on each of the major impoundments on the Refuge. Impoundments D and C continued to be good brood areas with several broods being seen on these areas all during the rearing season.

The number of wading birds was up slightly from 1968 with more immature birds being reported this year. One employee reported seeing what he thought was a sandhill crane, but we were unable to make a positive identification.

In spite of an outbreak of Trichomoniasis, the dove population was up slightly from 1968. The largest concentration, as usual, was at Ox Pen. They flocked to the proso planting at Ox Pen when it became mature. They also made good use of the wheat that was allowed to mature in the fields.

Banding: The Refuge did not have a banding quota for either doves or waterfowl in 1969. The only banding that we did was to band nesting female wood ducks and the resident geese that we received from the Savannah National Wildlife Refuge.

Personnel working on the Carolina Sandhills Mourning Dove Research Project banded 2,047 doves on the Refuge. It is believed that trapping success on the Refuge was down due to an outbreak of Trichomoniasis.

#### B. Upland Game Birds:

The wild turkey population stayed about the same as in 1968. No young broods were seen by refuge personnel during 1969. Some adult birds, mostly gobblers, were seen throughout the year. The turkey population is at such a low level, that for the last three years, we have been trying, with no success, to obtain turkeys from other refuges for restocking.

The heavy rains during the nesting and rearing seasons could have limited the number of young turkeys being produced, but did not seem to have any affect on quail production. Coveys of young quail could be seen all over the Refuge, particularly, around the farming fields and along the Visitors Route. The Visitors Route has a wide cleared right-of-way that has been seeded with *Sericea lespedeza*. The Sericea provided good cover for the quail during 1969.

#### C. Big-Game Animals:

The white-tailed deer population on the Refuge is still increasing. There were more deer on the Refuge in 1969 than in 1968. At one time during the year it was thought that the population might be down some from 1968. The low estimate was based on the fact that not as many deer were seen during the 1969 growing season as in 1968. This was probably due to the drought in 1968 that caused the deer to concentrate in fields searching for food.

This made them easier to see and count. In 1969, due to the above normal rainfall, an abundance of natural food was produced. Since the deer did not have to travel far to find food they stayed well dispersed and were hard to count. These low counts were the bases for the low population estimates. The increase in the deer population was evidenced by the increase in the number of deer killed during the hunts and by the high counts made during the fall. In 1969, seventy (70) deer were checked out during the 9 days of hunting as compared to 44 during the 9 days of hunting in 1968. This was an increase of approximately 60 percent in the number of deer killed as compared to an increase of only 16 percent in the number of hunters. The hunting around the Refuge was also good. Almost all of the private land adjacent to the Refuge was leased for deer hunting.

There were many reports of white deer being seen on the Refuge, but the refuge crew saw only three, two does and one small buck. The two does and the buck were seen many times by refuge personnel and visitors as they drove along the Visitors Route. They are very beautiful animals, and they made quite a hit with the visiting public.

Due to the abundance of available native foods, the number of complaints about deer damage to crops were down considerably from 1968.

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

Based on general field observations, most of the populations of these animals were about the same as in 1968. The population of fox squirrels and gray foxes were down slightly. Based on the amount of extra work that was required to clean out stopped up water control structures, the beaver population made the largest increase. Also up was the populations of gray squirrels, red foxes and skunks. In 1969, track counts were made at permanently marked points along a 20-mile route. In the future, counts will be made at each of the points each year in order to try and determine population trends. It is hoped that these scheduled counts will give more adequate information about these animals in future years.

#### E. Hawks, Eagles, Owls, Crows, and Black Birds:

Hawks are very common on the refuge, especially, the red-tailed, marsh and sparrow hawks. Red-tailed hawks seem to be more common this year than they have been for 3 or 4 years. Marsh hawks are a common sight at Ox Pen. They can be seen in the late afternoon or early morning gliding over the fields looking for food.

Horned owls were not reported as often in 1969 as they were in 1968. Whether this means a reduction in the number of these birds or just a lack of observation is not known. The screech owls seems to be on the increase. A number of them made their homes in wood duck nesting boxes. They were also observed more at night than in the past. On one occasion, a screech owl flew into one of the refuge vehicles through an open window. It was not injured and flew away as soon as it was released. On another occasion, one flew into the side of a refuge vehicle and was stunned, but it was able to fly away after a few minutes.

Black birds and crows are common but they did very little damage to refuge crops in 1969. They pulled a little corn at Martins, but the corn planted at Ox Pen was not bothered. This was in direct contrast to 1968 and 1967 when the corn had to be replanted because of damage by black birds.

Two golden eagles were seen on the refuge throughout the year. One of the golden eagles was an immature bird that was still on the Refuge at the end of the year. An immature bald eagle was also seen at Martins during November.

#### F. Other Birds:

A check made during the nesting season proved that there was a thriving population of Red-cockaded woodpeckers on the Refuge and the State Forest. The refuge forester located 100 active nesting trees in 2 days. There were 3 active nesting trees at the Refuge Headquarters. The red-headed woodpecker population was down from 1968. The number of purple martins was about the same as in 1968. Three different pairs of bluebirds were noticed on the refuge. Whip-poor-wills as well as chuck-will's-widows were heard calling during the nesting season.

#### G. Fish:

The fishing was only fair during 1969. Four refuge lakes and part of Black Creek was open to fishing. Watermilfoil was a serious hindrance to fishing in the impoundments.

All of the impoundments were checked by the Bureau's Fish Biologist. Fish reproduction was not good in any of the lakes. A supplemental stocking of 400 bass approximately 6" long was put in Lake Bee. This impoundment is located at the recreation area, and it is open for fishing all year.

#### H. Reptiles:

There were not as many rattlesnakes seen on the Refuge this year as in 1968, but they are still common. No pigmy rattlesnakes

were observed on the Refuge this year. Only one has been reported on the Refuge during the last 4 years, and it is believed that this reptile should be considered an endangered species for this Refuge. In fact any rattlesnake that comes around this crew becomes endangered real fast! Turtles are common in all of the impoundments.

#### I. Diseases:

There was an outbreak of Trichomoniasis (Trichomonas gallinae) in the mourning doves at OX Pen. Exactly how many birds were lost is unknown, but conservative estimates would be in the hundreds. Thirty-five birds with the disease were trapped and it is believed the disease severely reduced trapping success.

### III. REFUGE DEVELOPMENT AND MAINTENANCE

#### A. Physical Development:

The ice storm in February was almost the finishing touch as far as maintenance on the Refuge was concerned. The refuge has been operating under a reduced budget since 1965 (the Racket Program), and a large amount of deferred maintenance has accrued. Most of the Refuge buildings and equipment are old and require a large amount of maintenance. With limited funds and manpower, it has not been possible to make all of the repairs that were needed, therefore, a large backlog of work has accumulated. The devastating ice storm increased this backlog of work by at least 1,000 percent. Since no special storm damage funds were made available, all storm damage repairs and clean-up had to be made out of regular funds. This made it necessary to change most of this year's work plans. Unless additional funds are received, it will take years to make all repairs and to completely clean-up the area.

The Refuge Manager was also in charge of the Pee Dee Refuge from February 20, when Ken Maynard, the refuge manager retired, until April 5, when Bill Good, the new manager, arrived. During this period, the manager had to spend at least part of each day on the Pee Dee Refuge as the Refuge did not have an assistant manager.

Made emergency repairs to buildings, roads and dams following the ice storm in February.

Cleaned out about 60 miles of Refuge trails and 50 acres of upland food patches following the ice storm.

Graded out and ditched approximately 60 miles of Refuge trails after they were cleaned out following the ice storm.

Cleaned up at Headquarters following the ice storm. Removed about 80 trees that were completely destroyed by the ice and tons of tops and limbs that were stripped from the remaining trees.

Cleared and stumped about 5 acres in Field 4-2 after timber was removed following the ice storm.

Made miscellaneous repairs and started cleaning up at the Recreation Area. Only completed about one-fourth of the clean-up and about one-half of the repairs before running out of time and funds.

Q-1 and Q-2 were reroofed as a result of the ice storm.

Repaired side of Q-1 damaged by the ice storm and completely renovated the bathroom in Q-1.

Made major renovations to the interior of Q-2.

Cleaned out about 7 miles of boundary lines and posted out 5 miles of boundary. Also reposted closed areas before the Refuge hunt.

Cleaned and stumped about 1 acre at headquarters to be used as an equipment storage yard.

Constructed 2 nesting islands, each about 150 feet long for the resident goose flock. Also put in 2 drainage ditches at Martins Lake.

Put in a boat ramp and clayed visitor's turn-around at Martins Lake. Also planted Bermuda grass on the turn-around.

Repaired, clayed and planted Bermuda grass on the dam of Impoundment E. Also made critical area plantings along Park Road. Fertilized the roadsides along Park Road and the dams of Impoundments J and K.

Cleaned-up at the May Johnson tract after the buildings were removed.

Put in one mile of connecting road after gaining complete control of the May Johnson tract.

Constructed 12 new wood duck boxes and put them up. Also checked all boxes and relocated 15 boxes on more promising areas.

Completed a rough draft of the concept plan for the Refuge and submitted it to the Regional Office for review and comments.

Sprayed all dams for the control of woody plants. Also cut back brush along 9 miles of Refuge trails.

Put up additional safety and directional signs before Refuge hunt.

Started work on converting the old seed drying house into a wood shop.

Supervised State operations on the Refuge.

Planted about 30 acres of wheat for browse and supervised more than 1,400 acres planted by cooperative farmers.

#### B. Plantings:

1. Aquatics and Marsh Plants: None

2. Trees and Shrubs:

Personnel of the South Carolina Commission of Forestry planted 287 acres of pine seedlings on the Refuge. There were 282 acres of longleaf pine seedlings and 5 acres of Virginia pine seedlings planted. The seedlings were planted at the rate of 1,000 per acre and survival was satisfactory.

Several hundred flowering dogwood seedlings were planted by the Refuge crew near the headquarters area. Survival was very poor.

3. Upland Herbaceous Plants: None

4. Cultivated Crops:

Over 1,400 acres were cultivated in 1969. Almost all of the farming was accomplished by cooperative farmers. The Refuge crew helped clean out fields and planted 30 acres of wheat for browse. They also planted a few small patches of Bicolor lespediza. Crops grown during 1969 were as follows: 135 acres of corn, 387 acres of soybeans, 145 acres of wheat, 162 acres of Japonica lespediza, 28 acres of Sericea lespediza, and 200 acres of Abruzzi rye. Most of the crops produced fair to good yields. In contrast to the dry year of 1968, there was too much



rainfall at times during 1969 that interfered with the planting and cultivating of crops.

In addition, there were 254 acres of bahia grass that were mowed by the Refuge crew.

C. Collection and Receipts: None

1. Seed or other Propagules:

Most of the crops produced fair to good yields. Since the corn crop was better than expected, it was possible to leave more corn in the fields than had been planned for. Approximately 660 bushels of corn were harvested to be used for bait and food for the resident goose flock. The Refuge harvested 100 bushels of proso millet seeds that will be used on the Dove Research Project. Other seeds received were 100 bushels of wheat and 600 pounds of Japonica lespediza. The Refuge will also receive its share of the Bicolor and Sericea lespediza seeds as soon as they can be cleaned and delivered to the Refuge by cooperative farmers.

2. Specimens: None

D. Control of Vegetation:

Personnel of the South Carolina Forestry Commission treated 3,103 acres of young pine plantations with 2, 4, 5-T. The purpose of the treatment was to control weed tree sprouts, primarily turkey oak (Quercus laevis). The chemical was applied using a tractor mounted Hurricane Mist Blower. The chemical used was a low volatile ester of 2, 4, 5-T with an acid equivalent of 4 lbs. The mixture used was 2 parts 2, 4, 5-T, 1 part #2 diesel fuel and 13 parts water. They also treated 55 acres of older pine plantations with Dybar (Fenuron). The purpose of the treatment was to control hardwood sprouts. The chemical was applied by hand at the rate of 7.3 lbs per acre. The results of both treatments were good with no known adverse effects.

The only chemical used by the Refuge crew was 2, 4, 5-T to control woody plants on dikes, around lake edges and in upland food patches. An Isooctyl ester of 2, 4, 5-T with an acid equivalent of 4 lbs. per gallon was used. A Hardee sprayer using a mixture of 3 quarts of 2, 4, 5-T per 100 gallons of water was used. A coarse spray was used when wind conditions were 3 MPH or less. Good results were obtained with no noticeable adverse effects.

### E. Planned Burning:

#### 1. General:

The litter and tops deposited by the February ice storm were extremely thick. This presented a big safety hazard. Because of the difficulty of line construction through the tops and the heavy fuel on the ground, the personnel of the State Forest decided against controlled burning for either wildlife or silviculture.

All controlled burning in 1969 was limited to site preparation for replanting the clearcut pine plantations. A total of 53 acres was burned in 1969.

#### 2. Conditions prior to burning:

On the areas burned in 1969 there was a thick mat of broken limbs, stems and tops. The overstory had been completely removed.

#### 3. Conditions following burning:

The site preparation burns were completely successful. All litter was consumed by the fire.

### F. Fires:

Wild fire on Carolina Sandhills National Wildlife Refuge was no particular problem in 1969. Other areas of the State were plagued with a rash of wild fires during the summer and fall. The State Forest had numerous small fires along their public roads.

The Refuge's good record can be correlated to increasing patrol during fire danger periods and increasing efforts toward better public relations. There were four fires on the Refuge in 1969, totaling 37.3 acres. These fires ranged in size from 30 acres to .1 acres.

## IV. RESOURCE MANAGEMENT

### A. Grazing:

There is only one grazing permit on the refuge. This permit is issued to one of the Cooperative Farmers for 7 acres of land. The land is rented to the farmer on an annual cash basis of \$5.00 per acre.

B. Haying: None

C. Fur Harvest: None

D. Timber Removal:

All timber sales on Carolina Sandhills National Wildlife Refuge are conducted by the South Carolina Forestry Commission. The sales are handled locally by the personnel of the Sandhills State Forest. The primary factor in the 1969 timber management program was the February ice storm.

Light rain began freezing on the trees on February 15 and continued through February 16. By the afternoon of February 16 damage and destruction estimated at several hundred million dollars was reported in the Sandhills area of North and South Carolina. Timber stands were demolished. Power lines and poles were snapped and left in tangles of useless junk. Roofs and awnings on all types of buildings were wrecked. Streets and highways were blocked with broken timber and powerlines. A World War Two type artillery barrage could not have brought more havoc to this area.

Carolina Sandhills National Wildlife Refuge was centered in the area of destruction. Electricity was off at the Headquarters Area for one week and was off for two weeks at the Lake Bee Recreation Area. All Refuge roads and trails were blocked by broken trees. The roofs on Quarters No. 1 and Quarters No. 2 were destroyed and several storage sheds suffered extensive damage.

All timber types and age classes suffered some degree of damage. The hardest hit were the slash pine plantations ranging from 25 to 33 years old. Most of these areas suffered total destruction. The least damage occurred in the natural longleaf pine stands. The hardwood stands in the creek bottoms did not exhibit the total destruction of the pine stands but will suffer future loss through rot and decay caused by limb breakage.

As the weather warmed and the ice melted, the need for a vast salvage program became apparent. Before this program could be started, the local landowners met with the State Forestry Commission and requested that the State delay salvage operations on the State Forest and Refuge lands. The landowners felt that all timber products should be salvaged on private lands before the State tied-up all the logging contractors or flooded the markets with their large volume of salvage. To insure local good will, full salvage operations were not started until the last week in May.

It was decided that all trees with less than five green limbs per tree would not live through the summer. All trees with less than five green limbs and in merchantable concentrations, were slated for immediate salvage. All stands that did not have sufficient viable trees for a future cut, were scheduled for clearcutting. By using this criterion, salvage operations were expedited by allowing the timber to be salvaged without marking.

Logging equipment of every type and grade was used in this operation. The equipment varied from modern, high-speed skidders to horses and mules. Anyone who had either a pulpwood quota or a market for logs, could buy timber. Some of the operators moved 500 cords per week and some moved only 30 cords.

The local markets were quickly flooded with timber products. Some of the pulpwood was shipped as far as Florida. The supply of log and pulpwood rail cars became one of the limiting factors to salvage operations.

The primary salvage operations were completed by November, 1969. In the salvage operation 10,011 cords of pine pulpwood, 1,737,812 board feet of pine sawlogs and poles valued at \$20,454.35 were out for a total income of \$152,509.37. Of the 2,867 acres covered in the operation, 175 acres were clearcut.

Those stands clearcut were:

Compartment	Stand
No. 1	22
No. 2	52
	59
	62 (4 acres)
No. 6	29
No. 7	21
No. 8	2
	4
No. 9	27
	56
	57
No. 10	22

In November, the secondary phase of the salvage operation began. All stands were inspected. Those areas having merchantable volumes of damaged timber likely to suffer disease or insect damage before a regularly scheduled cut, were slated to be selectively marked and sold. This second phase of the salvage program is expected to continue for the next two years.

Under the secondary phase of the salvage operation, two sales were made. The first sale in Compartment No. 3, consisting of 249 cords of pine pulpwood, sold for \$2,653.23 or \$10.65 a cord. The second sale, located in Compartment No. 1, consisting of 250.22 cords of pine pulpwood and 73,790 board feet of pine sawlogs, sold for a total of \$5,705.55.

One regularly scheduled sale was sold in Compartment No. 1. Before the sale could be cut, the ice storm struck. The damaged timber was marked and sold to the original buyer at the original bid price. The buyer paid \$42,966.82 for 729,257 board feet of pine sawlogs and 522 cords of pine pulpwood.

The total income for timber products cut on the Carolina Sandhills National Wildlife Refuge was \$160,818.15. A total of 10,510.42 cords and 1,811,602 board feet of pine sawlogs were cut on 2,968 acres.

## V. FIELD INVESTIGATION OR APPLIED RESEARCH

### A. Progress Report:

Fomes Annosus Study: A Fomes Annosus Evaluation Study is being conducted on this Refuge by the personnel of the U. S. Forest Service. Fifty-two, 1/10 acre plots have been set up in a 30 year old slash pine plantation. The purpose of the study is to determine the effect and rate of spread of this disease in slash pine plantations.

The ice storm liquidated the phase of the study being conducted on the Refuge. The 30 year old plantation was almost completely destroyed. Forest Service personnel are now in the process of re-establishing the study. The replanted, clearcut areas will be used to determine the effect of Fomes annosus on seedlings.

A progress report, as such, is not available for the study. The study indicates that the only practical control of the disease is to limit cutting operations to the hot, dry, summer months. At this time there are fewer viable Fomes annosus spores available for reinfection.

Carolina Sandhills Mourning Dove Investigations by Spencer Amend: Productive study of mourning dove populations in the Sandhills and adjacent regions of North and South Carolinas continued during the second year of a long-term research program. Mourning dove breeding population levels in the study area, as measured by randomly selected call-count routes, did not differ between 1968 and 1969. Weekly call-counts indicated high levels of breeding activity from March through August.

The intensified dove-banding program continued, resulting in 4,166 doves banded by Project personnel during the preseason period (June through August). State cooperators more than doubled their 1968 banding successes after attending a Project trapping-banding demonstration. Studies continued in search of the most efficient methods of capturing doves. Semicircular traps and drop-door traps take advantage of doves' behavior patterns and were more successful than funnel traps. Sex ratios obtained by trapping varied with the time of day. Males outnumbered females before 9:30 a.m. and after 3:30 p.m., and females outnumbered males during midday.

The change in bag limit from 12 to 18, a part of the Eastern Management Unit experiment testing the effects of regulations on the dove population, resulted in a 9.3 percent increase in the kill on one of the management area hunts in the study area. Age ratios showed considerable variation according to bag size; 3.5 immatures:adult in bag sizes 1-9 and 8.5 immatures:adult in bag sizes 10-18.

Field Testing of DRC-736: A field test to determine the effectiveness of DRC-736 applied to seed corn to prevent sprout pulling by black birds was conducted at Ox Pen. Three fields of 5 acres each were planted at Ox Pen. Two of the fields were planted using treated corn and the other with untreated corn so that it could be used as a check. Even though black birds were observed in all 3 fields, there was no observable damage caused by the birds on the treated or untreated fields. This was in direct contrast to the last two years, when corn had to be planted over 3 times in 1967 and 2 times in 1968?

## VI. PUBLIC RELATIONS

### A. Recreational Use:

The number of visitors to the Carolina Sandhills National Wildlife Refuge continues to increase. Public use is centered around the Lake Bee Recreation Area and the Self-guiding Visitor's Route.

Since the entrance fee for the Lake Bee Recreation Area has been discontinued, public use has increased to its former level. Boy Scouts, Churches and other organized groups seem to favor this area. Over 200 of these various people have been seen using Lake Bee in one day.

The Self-guiding Visitors Route is receiving heavy use. Nature lovers from both North and South Carolina drive this road to observe the deer, geese, ducks, beaver, fox and other species

of wildlife that can be seen on the area. Several hundred people drive this route each week-end.

B. Refuge Visitors:

Mr. C. D. Burch	State Game Warden	Numerous Visits
Mr. W. R. Jones	" " "	" "
Mr. D. W. Hendrick	Ruby Tower	" "
Mr. Otto Florschutz	Washington, N. C.	" "
Mr. Rhett Bickeley	Sandhills State Forest	" "
Mr. Joe Milles	" " "	" "
Mr. Dale Shelton	" " "	" "
Mr. Richard Harnes	" " "	" "
Mr. Bob Ford	" " "	" "
Mr. Paul Blessing	" " "	" "
Mr. Fred Horn	S. C. Forest Commission	" "
Mr. Gus Cato	Cooperative Farmer	" "
Mr. A. C. McLeod	" "	" "
Mr. Jimmy Johnson	" "	" "
Mr. Bobby McLeod	" "	" "
Mr. Bill Good	Pee Dee Refuge	" "
Mr. Ron Tansill	Regional Office	" "
Mr. Ken Maynard	Pee Dee Refuge	" "
Mr. W. C. Carter	SCS, Chesterfield, S.C.	" "
Dr. D. E. Davis	N. C. State University	1/13/69
Mr. Ted Ball	Regional Office	2/25/69
Mr. Ivan A. Baldist	Camden, S. C.	3/17/69
Mr. T. E. Walls	" "	3/17/69
Mr. James E. Howe	Round Oak, Ga.	3/18/69
Mr. Sam W. Sterman	Pickens, S. C.	5/1/69
Mr. J. H. Miller	Columbia, S. C.	5/1/69
Mr. Richard Watkins	Charlottesville, Va.	5/1/69
Mr. H. O. Garrett	Orangeburg, S. C.	5/8/69
Mr. Dan V. Evans	Santee, S. C.	5/8/69
Mr. Tom Driggs	Davidson College	5/12/69
Mr. David Johnson	Wildlife Services	5/27/69
Mr. W. C. Lehmann	S. C. Conservation Camp	6/4/69
Mr. John W. Long	" " "	" "
Miss Pam Fentress	" " "	" "
Mr. Ted Beckett	" " "	" "
Miss Gail La Grange	" " "	" "
Mr. Carlisle McNair	" " "	" "
Miss Pam Miller	" " "	" "
Miss Iva Lea Mond	" " "	" "
Miss Bette Moseley	" " "	" "
Miss Joyce Chavis	" " "	" "
Mr. Bradley Hurt	" " "	" "
Miss Carol Hoffmeier	" " "	" "
Mr. Herbert H. Kuster	" " "	" "

# MONTHLY RECREATIONAL USE REPORT

Refuge name  
**Carolina Sandhills**  
State  
**South Carolina**

State  
Code **10**  
(1-2)

Congressional  
District Code **05**  
(3-4)

Refuge  
Code **115**  
(5-7)

Report Yr. | Mo.  
Period **69** |   
(8-11)

(Card Columns). . . . . (12-13) (14-18) (19-25)				(Card Columns). . . . . (12-13) (14-18) (19-25)			
ACTIVITY	Code	VISITS FOR THE MONTH		ACTIVITY	Code	VISITS FOR THE MONTH	
		Total Number	Total Hours			Total Number	Total Hours
Hunting: Big Game	01	2,841	28,410	On-Site Programs	22	365	730
Upland Game	02			*Miscellaneous Wildlife	23		
Waterfowl	03						
Other Migratory	04			Swimming	24		
Other	05			Boating	25		
Bow	06			Water Skiing	26		
Fishing: Salt Water	07			Camping	27		
Warm Water	08	2,790	11,060	Group Camping	28		
Cold Water	09			Picnicking	29	7,990	23,970
Environmental Education	10			Horseback Riding	30		
Wildlife Photography	11			Bicycling	31		
Wildlife Observation	12	1,766	5,298	Winter Sports	32		
Conducted Programs	13			Fruit, Nut and Vegetable Collecting	33		
Field Trials	14			*Miscellaneous Non-Wildlife	34		
Wildlife Trails	15			Peak Load Day	35	522	
Wildlife Tours/Routes	16			Actual Visits	36	32,694	
Visitor Contact Stations	17	14,860	29,760				
Camping (wildlife related)	18	312	3,744	Fee Area Use	37		
Picnicking (wildlife related)	19	1,065	2,130	Number of Fee Areas	38	(14-18)	
Wildlife Interpretive Center	20			Fee Collections	39	\$	
Off-Site Programs	21			Collection Costs	40	\$	



Miss Chris Cannon	S. C. Conservation Camp	6/4/69
Miss Kathy Epps	" " "	" "
Mr. Joe Squires	" " "	" "
Mr. W. O. Stieglitz	Regional Office	6/19/69
Mr. Henery N. Oman	Society Hill, S. C.	7/13/69
Mr. E. W. Whitney	Fishery Services	7/31/69
Mr. Ron Hight	Santee Refuge	9/5/69
Mr. Wallace Nichols	Heath Springs, S. C.	9/18/69
Mr. Galloway	State Patrol	9/22/69
Mr. Clinton	" "	9/22/69
Mr. H. M. Funderburck	Lancaster, S. C.	9/26/69
Mr. Bill Bartle	Catawba Timber Co.	9/30/69
Mr. Don Harke	Wildlife Services	10/8/69
Mr. J. Webb	Chesterfield, S. C.	10/30/69
Mr. B. A. Grigg	State Conservation Officer	10/28/69
Mr. Clyde Ward	" " "	" "
Mr. H. L. Lee	" " "	" "
Mr. W. O. Stieglitz	Regional Office	12/5/69

#### C. Refuge Participations:

Manager Garris attended the refuge managers conference at Atlanta, Georgia from January 12-17, 1969.

The McBee Agricultural Class, McBee, South Carolina, toured the Refuge on February 7, 1969. Manager Garris guided them. While the class was on the area, Roy Rogers, Biological Technician, demonstrated the basic principles of duck banding.

From April 6-26, 1969, Manager Garris attended the Supervision-Management course at Arden Hills, Minnesota.

During the week beginning April 21, 1969, five schools from North Carolina used the Lake Bee Recreation Area. There was an average of 30 students from each school.

On May 1, 1969, Mr. Watkins of the Federal Water Pollution Control Administration and Mr. Miller of the South Carolina Health Department, was accompanied by Forester Howe on an inspection of the Refuge and the State Forest. The purpose of the tour was to make a survey of water pollution control facilities and abatement practices at this station.

The annual, joint planning, conference between the Bureau of Sport Fisheries and Wildlife and the South Carolina State Commission of Forestry was held on June 18, 1969, at the State Commission of Forestry Building in Columbia, South Carolina.

The Commission was represented by: John R. Tiller, State Forester; E. C. Pickens, Assistant State Forester; Fred W. Horn, Management Assistant; Joe Mills, Director, Sandhills State Forest and Rhett Bickley, Forester, Sandhills State Forest. The Bureau was represented by: Robert Lines, Regional Supervisor, Division of Realty; Walter O. Stieglitz, Assistant Regional Supervisor, Division of Wildlife Refuges; Verlon E. Carter, Forester, Division of Wildlife Refuges; George R. Garris, Refuge Manager and James E. Howe, Forester, Carolina Sandhills National Wildlife Refuge.

The Refuge Manager and Forester presented a slide talk to the Hartsville, South Carolina Lions Club on July 31, 1969. A series of slides explaining the Federal Wildlife Refuge System was shown to the 31 members present.

Fifteen members of the South Carolina Conservation Camp, accompanied by the camp staff, visited the Refuge on June 4, 1969.

The 500 man, Headquarters 30th Infantry Division (M), Artillery, camped on the Refuge on the days of August 2-3, 1969.

On July 24, 1969, the Refuge Manager gave a wildlife oriented slide talk to the Technical Action Panel in Chesterfield, South Carolina. The Technical Action Panel is an organization of State, Federal and County workers in Chesterfield County.

The Refuge Forester, James Howe, presented a wildlife oriented slide talk to a community meeting of 20 people at the White Oak Church on August 28, 1969.

On November 5 and 6, 1969, Manager Garris attended a conference entitled Multiple Use of Southern Forests at Pine Mountain, Georgia.

Manager Garris attended a Pesticide Applicators Conference on November 18 and 19, 1969 at Florence, South Carolina.

The Refuge Manager attended the Technical Action Panel meetings held once a month in Chesterfield, S. C.

#### D. Hunting:

Two deer hunts were conducted on the Refuge during 1969. The first hunt was for six days that ran from October 27 through November 1, and the second hunt was for 3 days from November 6 through November 8. Both hunts were for bucks only with visible antlers. Permits were not required but each hunter had to register each day before he could hunt. A total of 2,159 hunters

registered for the first hunt and 790 hunters registered for the second hunt for a total of 2,949 hunters for both hunts. This was an increase of approximately 16 percent over the 2,545 hunters that registered in 1968. The number of hunters varied from a high of 522 on opening day to a low of 162 on the next to last day. Where permits are not needed to control the number of hunters, this registration system has proved to be real effective in obtaining information on the number of hunters and also as a psychological control on them. Two registers are used, one at Headquarters and one at the Lake Bee Recreation Area. Spot checks in the field failed to turn-up anyone who had not signed the register.

A total of 70 deer were checked out as compared to 44 in 1968. All of the deer were in good condition. There was an increase of 16 percent in the number of hunters and an increase of approximately 60 percent in the number of deer checked out. Average weight for all deer decreased from an average of 130 pounds (live weight) in 1968 to an average of 124 pounds (live weight) in 1969. This decrease was probably due to an increase in the number of deer and a decrease in the amount of available food during the winter and spring of 1968-69. Due to a severe drought that occurred during the 1968 growing season, only a small amount of natural food was produced. Also the ice storm in February might have had some effect on them. In spite of the decrease in weight, there were over 20 real good racks.

The hunters on the refuge continue to improve both in hunting skills and in compliance with hunting regulations. For example, the number of cases made in 1969 was 3 as compared to 9 in 1968 and 23 in 1967. We still have a litter problem and a few vehicles that are driven in areas where they are not allowed, but for the most part, the hunters this year were a well behaved group. Refuge and State personnel received many compliments from hunters on the way they were treated in the field. The number of hunters who take their vacation during our first week of hunting is increasing each year. There were no accidents reported again this year.

#### E. Violations:

During the last three years, the number of violators apprehended on the refuge has decreased each year. For comparison, twenty-six (26) citations were given in 1967, fifteen (15) in 1968, and only seven (7) in 1969. It is believed that the number of undetected violations has decreased at about the same rate. There is still some night hunting for deer along the public roads that traverse the Refuge. The largest enforcement problems facing the refuge is still trespassing dogs, even though, there has been a large decrease in the number of trespassing dogs since

a Cost Fee system was initiated in 1967. The minimum charge under the Cost Fee system is \$5.00 for each dog apprehended on the refuge. A list of violations and their dispositions is shown below:

<u>Name &amp; Address</u>	<u>Violations</u>	<u>Disposition</u>
McKeithan, Grady Fort Mills, S. C.	Unauthorized Firearm on the Refuge	Fined \$25.00 by Magistrate
Walker, Brady Fort Mills, S. C.	Unauthorized Firearm on the Refuge	Fined \$25.00 by Magistrate
Wilkes, Steve Hartsville, S. C.	Unauthorized Firearm on the Refuge	Fined \$25.00 by Magistrate
Johnson, W. C. Hartsville, S. C.	Unauthorized Firearm on the Refuge	Fined \$25.00 by Magistrate
Moss, Doug Florence, S. C.	Hunting Closed Area	Fined \$12.00 by Magistrate
Moss, Robert Florence, S. C.	Hunting Closed Area	Fined \$12.00 by Magistrate
Oliver, J. W. Hartsville, S. C.	Hunting Closed Area	Fined \$12.00 by Magistrate

In addition to the violations above, one case that was made in November, 1968, against Mr. John W. Rivers, was carried to Federal Court in Columbia, S. C. and heard before U. S. Commissioner Henry Kirkland on March 4, 1969. Mr. Rivers was charged with trespassing and disorderly conduct. He was fined \$100.00 and 30 days in jail, but \$65.00 and the 30 days in jail were suspended and Mr. Rivers was put on a year of probation. This seems to be the best type of punishment. Mr. Rivers was not seen on the refuge during 1969.

#### F. Safety:

Safety is emphasized on this station. An effort is made at all times to keep the staff alert and cautious of all safety hazards. Warning signs have been placed on all hazards that may be encountered by the visiting public.

All equipment is constantly checked for safety violations. Roll bars were installed on the following equipment: Caterpillar D6, Allis-Chalmers HD5, Oliver 77, International 404 and Ford 601.

The last lost time accident occurred at this station on October 30, 1963. Since that time there has been 1,881 days and 83,380 hours worked. Safety meetings were held monthly. At these meetings, all safety material received from the Regional Office was read and discussed. In addition, various safety slide programs were presented by the Refuge staff.

## VII. OTHER ITEMS

### A. Items of Interest:

Mr. James Howe, Forester, reported for duty on April 17, 1969. Mr. Howe transferred from the Piedmont Refuge in Georgia. He is in charge of coordinating forestry programs on the Refuge and the State Forest. He and his wife are welcome additions to this Station.

The refuge assumed complete control of the May Johnson tract after Mr. May Johnson died on January, 1969. This tract was purchased from Mr. Johnson in 1965 subject to the right of Mr. May Johnson, for his lifetime, to use and occupy for residential purposes only, the buildings and approximately 4 acres of land. After Mr. May's death, one of his sons decided that he would continue to live on the place. He was given 3 months in which to move after his father died, but he refused to do so. Finally he had to be removed by U. S. Marshals.

Mr. Roy Rogers, Biological Technician, and Mr. Olin Morrison, Auto Mechanic, received Superior Performance Awards along with checks for \$150.00 for their outstanding work performance following a reduction in this Station's operating budget.

Mr. James Howe, Forester, received a check for \$75.00 for his suggestion that aluminum nails be used when attaching signs to trees.

Mr. Ernest Holland, who had been refuge manager here for over 14 years, passed away in March. The refuge staff still receives complimentary remarks about him. He will always be a part of this Sandhills Country.

We would like to thank Mrs. James Howe for editing and typing most of the Narrative. Mrs. Howe is employed by the Dove Research Project that is attached to the Carolina Sandhills National Wildlife Refuge.

B. Photographs:

The photographs on the following pages depict some of the Refuge activities conducted in 1969. The Refuge staff would like to thank Spencer Amend, research biologist, CSMDRP, attached to Carolina Sandhills National Wildlife Refuge for several of the photographs and Dan Upton, South Carolina Wildlife Resources Department, for the photograph of the mourning dove banding, seminar-workshop.

*George R. Carris*  
George R. Carris  
Refuge Manager

SUBMITTED: 2/2/70

APPROVED: Walter C. [unclear]

Assistant Regional Supervisor



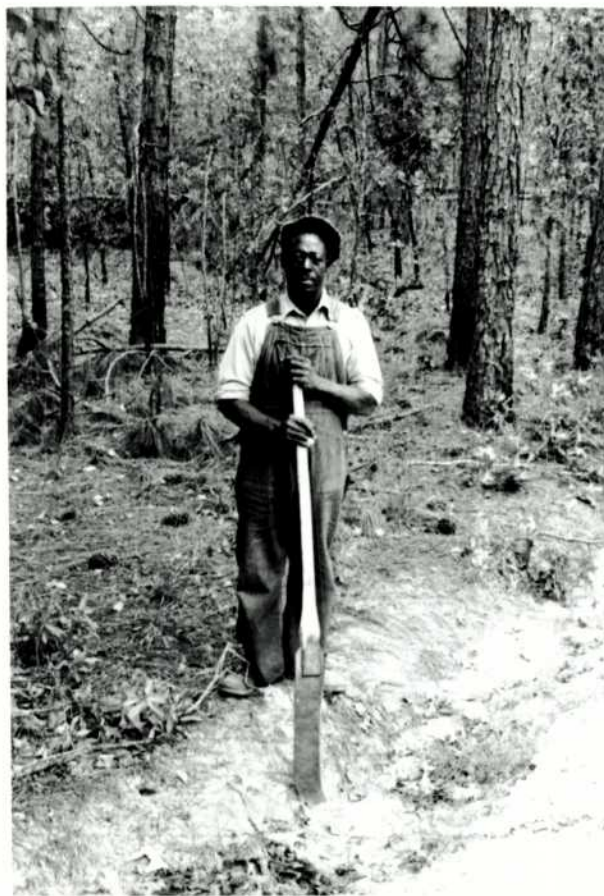
Top Photo: Roy Rogers, Biological Technician, receiving his Superior Performance Award from George Garris, Refuge Manager.

Bottom Photo: Olin Morrison, Refuge Mechanic, receiving his Superior Performance Award from the Refuge Manager.





Top: James Howe, Forester, receiving a check for Suggestion Award 4-69-8 from the Refuge Manager.



Left: Ellice Sweeney, temporary laborer.





69 • DEC •



Olin Morrison and Roy Rogers releasing Canada Geese (Branta canadensis canadensis) shipped from the Savannah National Wildlife Refuge. These birds were released at Martins Lake in hope of establishing a resident breeding flock.



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Some more of the Savannah National Wildlife Refuge geese as they were released. All except two of the young geese survived and reached full growth.





On February 15, a severe ice storm hit the Sandhills Area of North and South Carolina. Damage was in the hundreds of millions of dollars.



Top Photo: Broken powerlines and broken timber clogged roads and trails.

Bottom Photo: The Refuge Manager's wife inspects her favorite shrub.





Top Photo: The slash pine (Pinus elliotti) plantations from 25 to 35 years old suffered the heaviest damage.

Bottom Photo: The Refuge Visitor's Route.



69 • 310 •

The Refuge Headquarters Area and some of the debris hauled from it.  
Approximately \$2,000 was spent to clean this area.





Olin Morrison and drafted help clearing the Refuge Visitor's Route.



Top Photo: The weight of the ice on the power lines to Quarters #1 pulled the side from the building.

Bottom Photo: The new roof on Quarters #1.





The ice storm spared no species. Hardwood as well as pine stands were wrecked. The top photo shows blackjack oak (Quercus marilandica) and the bottom photo is of natural stands of long-leaf pine (Pinus palustris).



A 30 year old slash pine plantation after the ice storm. About 25 cords per acre were salvaged from these plantations.





Two, 33 year old slash pine plantations during and after salvage. These areas will be burned, disked and replanted in 1970.





Damaged timber was salvaged in all possible ways. Top Photo: A combination pulpwood and log operation. Bottom Photo: Timber being salvaged for poles.



Top Photo: Verlon Carter, Region 4 Regional Forester observing ice damage.

Bottom Photo: The Sandhills State Forest, adjacent to the Refuge, also suffered heavy damage.





The Lake Bee Recreation Area.



68 • 310 •



68 • 310

Top Photo: Lake Bee Recreation Area.

Bottom Photo: The same area after four men and two trucks worked nine days.





89 • 310



Top Photo: One of the stands that was reserved for secondary salvage.

Bottom Photo: One of the better upland hardwood stands on the Refuge. This stand shows little damage.





• DIC • 69

A nesting cavity of the red-sockaded woodpecker (Dendrocopos borealis borealis (Vieillot)). The Carolina Sandhills National Wildlife Refuge has a large nesting population of these rare and endangered birds.



AMEA'D



AMEA'D

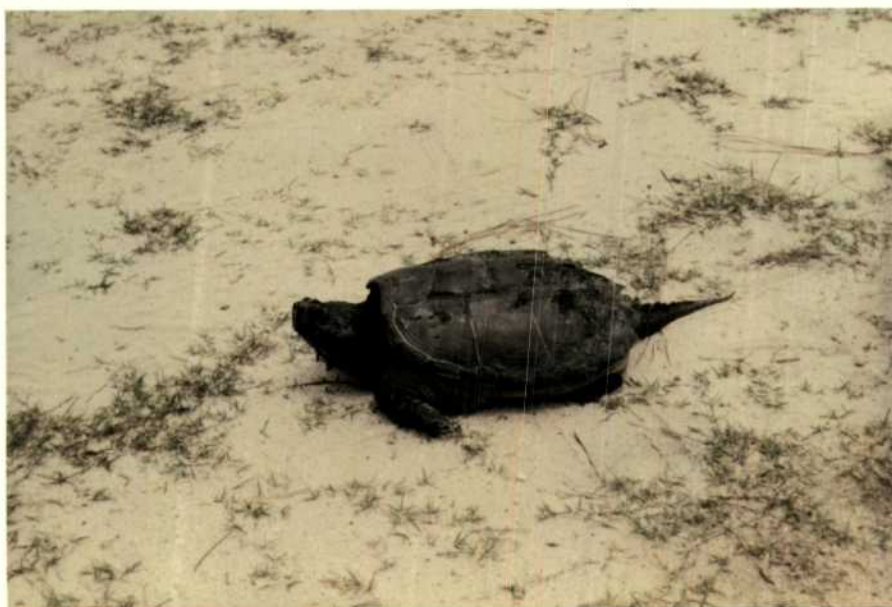
Approximately 1,500 Canada Geese (Branta canadensis canadensis) winter here. About 45 acres of corn (Zea maise) and 140 acres of rye (Secale cereale) are planted each year by cooperative farmers to feed these birds.





Top Photo: A typical wood duck (*Aix sponsa*) nest in the round, paper nesting boxes now being used on this Refuge. Our nesting box use rate for 1969 was 62%.

Bottom Photo: One of the quirks of nature observed in our nesting box program. There were 13 hatched eggs in the box. It is thought that these ducklings were the result of a late hatch caused by dump nesting.



Some of the factors limiting wood duck production on Carolina Sandhills. The top photo is of the young of a screech owl (Otus asio) that has nested in wood duck box. The snapping turtle (Chelydra serpentina) is thought to greatly reduce the number of ducklings to flight stage.





68 • 310



68 • 310

Two of the management problems on Carolina Sandhills. The water control structure is completely plugged by beaver (Castor canadensis). The Refuge sign in the lower photo has been well punctured by man.



The Martins Lake public boat landing under construction and completed. Because of the deep sand in this area, sod must be hauled and spread over a project to secure steep slopes. Seed will wash away before they can establish a root system.





Roy Rogers constructs a nesting island for the resident flock of Canada Geese. Some of the resident flock, both flying and non-flying birds are shown in the bottom photo.



Top Photo: Carolian Sandhills offers limitless opportunities for wildlife observation and photography.

Bottom Photo: The group from the South Carolina Conservation Camp are fascinated by one of the little creatures found on the area. Game Management Agent Bill Lehmann and Manager Garris are observing from a distance.





On May 2, 1969, a mourning dove banding, seminar-work shop was held on the Refuge. A total of twenty-two wildlife management personnel, both federal and state, attended the school. As a result of this school, South Carolina increased its mourning dove banding program 150%. In the photo Spencer Amend, research biologist, CSMDRP, attached to Carolina Sandhills, releases a banded mourning dove. Photo courtesy of Dan Upton, South Carolina Resources Department.



Top Photo: Two of the fishermen who frequently use Martins Lake.

Bottom Photo: The entomology class of Davidson College, North Carolina, on their annual trip to the Refuge to collect insects.





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DEC



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Three of the happy nimrods that participated in the Refuge managed hunt. Seventy bucks with visible antlers were killed in nine days of hunting.

3-1750

FORM NR-1

(Rev. March 1953)

# WATERFOWL

REFUGE

MONTHS OF

**January 1**

TO

APR 11 30

169

[illegible]

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

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

REFUGE Carolina Sandhills NWR

MONTHS OF January 1 TO April 30, 19 69

(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	100								77,800		
Cackling											
Brant											
White-fronted											
Snow									14		
Blue									92		
Other											
Ducks:											
Mallard	400	200							66,050		
Black	200	100							43,600		
Gadwall											
Baldpate	50	50							7,400		
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood	1100	1100	900	900	900	900	900	900	121,700	7	42
Redhead											
Ring-necked	50	50							5,100		
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

(Over)

3-1750

**Form NR-1**

(Rev. March 1953)

# WATERFOWL

**REFUGE**

MONTHS OF MAY 1

TO August 31, 1969

[illegible]

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

WATERFOWL  
 (Continuation Sheet)

REFUGE Carolina Sandhills NWR

MONTHS OF May 1 TO August 31, 19 69

(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	20	20	20	20	20	20	20	20	2,294	3	12
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard											
Black											
Gadwall											
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood	1050	1100	1100	1150	1200	1100	1000	1000	125,150	45	550
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

(Over)

	(5)	(6)	(7)		SUMMARY
	<u>Total Days Use</u>	<u>Peak Number</u>	<u>Total Production</u>		
Swans	_____	_____	_____	Principal feeding areas	<del>Martins Lake, Wooded Impoundments,</del>
Geese	<u>2,294</u>	<u>22</u>	<u>12</u>		<del>and Ox Pen.</del>
Ducks	<u>125,150</u>	<u>1200</u>	<u>150</u>	Principal nesting areas	<del>Wooded Impoundments, Ox Pen,</del>
Coots	_____	_____	_____		<del>and Lake 16.</del>
				Reported by	<u>Garris, Rowe, Rogers, Morrison</u>

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).



3-1750  
Form NR-1  
(Rev. March 1953)

# WATERFOWL

REFUGE      Carolina Sandhills

MONTHS OF Sept. 1 TO Dec. 31, 19 69

[illegible]

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

WATERFOWL  
(Continuation Sheet)

REFUGE Carolina Sandhills

MONTHS OF Sept. 1 TO Dec. 31, 19 69

(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:	380	400	420	550	550	600	650	900	37,816		
Canada											
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:	600	1000	1200	1200	1400	2100	2200	2500	89,800		
Mallard	500	600	900	1200	1200	2600	2600	2600	87,575		
Black									518		
Gadwall	20	20		75	75	75	150	150	3,869		
Baldpate									56		
Pintail									14		
Green-winged teal									231		
Blue-winged teal											
Cinnamon teal											
Shoveler	800	800	1200	1600	1600	2200	1400	2000	124,200		
Wood											
Redhead			20	50	50	100	100	100	2,696		
Ring-necked											
Canvasback		4							28		
Scaup											
Goldeneye											
Bufflehead		3							21		
Ruddy											
Other											
Merganser, Hooded					20				140		
Coot:											

(Over)

	(5)	(6)	(7)		SUMMARY
	Total Days Use	Peak Number	Total Production		
Swans	_____	_____	_____	Principal feeding areas	<u>Martins, Ox Pen and the</u>
Geese	<u>37,816</u>	<u>900</u>	_____		<u>wooded impoundments</u>
Ducks	<u>309,148</u>	<u>7350</u>	_____	Principal nesting areas	_____
Coots	_____	_____	_____		_____

Reported by Garris, Rogers, Howe, Morrison

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 NWR

Months of January 1

to April 30

19 69

(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	Jan. 1	8	April	1	Apr. 28				720
Green Heron		3	Mar. 7	8	April	1	Apr. 30				480
Pied Billed Grebe		4	Mar. 7	15	April	2	Apr. 28				1200
II. <u>Shorebirds, Gulls, and Terns:</u>											
Spotted Sandpiper		10	March	60	April	3	Apr. 28				3600

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. <u>Doves and Pigeons:</u>									
Mourning dove	6500	Jan	6500	Jan	4500	April		900	600,000
White-winged dove									
IV. <u>Predaceous Birds:</u>									
Golden eagle	2	Jan 1	2	Jan - Feb	1	Mar. 14			146
Duck hawk									
Horned owl			50						6,000
Magpie									
Raven									
Crow	50	Jan 15	1200	April	25	April 28		300	108,000

Reported by **Garris**

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 (Caviiformes 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 NWR

Months of

May 1

to

August 31

19 69

(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>											
Pied Billed Grebe		4	May 1	25	7/15-8/31	3	Present			Unknown	1,800
Great Blue Heron		1	May 1	15	5/1-8/31	2	Present			"	1,100
American Egret		6	June 25	30	July	7	Present			"	1,800
Little Blue Heron		2	July	10	7/15-8/31	2	Present			"	600
Green Heron		2	May 1	35	5/1-8/31	1	Present			"	1,800
II. <u>Shorebirds, Gulls, and Terns:</u>											
Spotted Sandpiper		5	May 17			3	June 5				2,600

(over)

(1)	(2)		(3)		(4)		(5)		(6)
III. <u>Doves and Pigeons:</u>									
Mourning dove	5,000	May	15,000	July-Aug.	6,000	August		3,500	861,000
White-winged dove									
IV. <u>Predaceous Birds:</u>									
Golden eagle	1	8/28	1	August	1	Present			
Duck hawk									
Horned owl		Present	55	August		Present			6,100
Magpie									
Raven									
Crow	30	May	1,200	May	1,200	August		400	110,700

Reported by Garriss, Howe, Rogers

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 Months of September 1 to December 31 19 69

(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
<b>I. <u>Water and Marsh Birds:</u></b>										
Pied Billed Grebe	3	Sept. 1	30	Dec.	6	Dec.31				2,440
Great Blue Heron	1	Sept.15	10	Sept.	1	Dec. 7				850
American Egret	3	Sept.27	15	Oct. 15						750
Little Blue Heron	6	Sept.27	36	Oct. 17						900
Green Heron	2	Sept.15	30	Oct. 17						1,830
<b>II. <u>Shorebirds, Gulls, and Terns:</u></b>										

(over)

(1)	(2)		(3)		(4)		(5)			(6)
II. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	6000	Sept. 1	6000	Sept.	3500	Dec. 31				610,000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	1     1000	Oct. 9     Present	1   50  1000	    Sept.	1    800	Nov. 5    Dec. 31				40  4,800  103,700
Bald Eagle	1	Nov. 21	1		1	Dec. 12				30

Reported by Garris, Howe, Rogers, Morrison

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.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
BUREAU OF SPORT FISHERIES AND WILDLIFE  
WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Carolina Sandhills NWR For 12-month period ending August 31, 1969

Reported by Garris Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat		(3)	(4) Breeding Population	(5) Production	
	Type	Acreage	Use-days			
NORTHERN ZONE	Crops	200	Ducks	39,695	60	50
	Upland	12,000	Geese			
	Marsh		Swans			
	Water	90	Coots			
	Total	12,290	Total	39,695	60	50
CENTRAL ZONE	Crops	1,175	Ducks	510,367	830	1,32
	Upland	19,275	Geese	124,835	6	12
	Marsh		Swans			
	Water	295	Coots			
	Total	20,745	Total	635,202	836	1,44
SOUTHERN ZONE	Crops	229	Ducks	17,012	10	10
	Upland	11,730	Geese			
	Marsh		Swans			
	Water	17	Coots			
	Total	11,976	Total	17,012	10	10
TOTAL	Crops	1,604	Ducks	567,074	900	1,92
	Upland	43,005	Geese	124,835	6	12
	Marsh		Swans			
	Water	402	Coots			
	Total	45,011	Total	691,909	906	504
	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 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.

\*Upland areas including 1500 acres of farmland. The rest is scrub oak, bottomland hardwood and pine.

3-1752

(Form NR-2)

(April 1946)

## UPLAND GAME BIRDS

Refuge **Carolina Sandhills NWR**

Months of May 1 to August 31, 1969

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White Quail	44,000*	18	60	500	50/50	N	O	N E	2,500	Information collected while on routine Patrol.
Eastern Wild Turkey	44,000*	880	0	10	50/50	N	O	N E	50	
*Upland areas including 1500 acres of farmland and open areas. The rest is scrub oak, bottomland hardwood and pine.										

(April 1946)

## UPLAND GAME BIRDS

**Carolina Sandhills NWR**

1969

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White Quail	44,000*	14.7			50/50	N	O	N E	3,000	Information collected while on routine patrol. Also a few roadside counts were made.
Eastern Wild Turkey	44,000*	880			60/40 M/F	N	O	N E	50	
*Upland areas including 1500 acres of farmland. The rest is scrub oak, bottomland hardwood and pine.										

## BIG GAME

Form NR-3  
(June 1945)Refuge Carolina SandhillsCalendar Year 1969

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	141,000**  **(Pine and hardwood uplands and hardwood bottomland, and upland open areas.)	350	70				*	*	*			1350	930	

## Remarks:

\*In estimated 300 deer lost to predation, diseases, and other natural causes. Also include deer that were shot and not recovered during public hunts. Other deer were killed on private land adjoining the refuge.

Reported by Garris, Howe, Rogers, Morrison

## 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 NWR

Year ending April 30, 1969

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)   Total  Popula-  tion
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control*	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
								Permit Number	Trappers' Share	Refuge Share				
Raccoon	44,000	49												900
Beaver	4,000	11												360
Mink	4,000	133												30
Otter	4,000	111												35
Muskrat	4,000	100												45
Opposum	44,000	733												60
Skunk (Stripped)	44,000	200												220
Gray Squirrel	44,000	73												600
Fox Squirrel	44,000	88												500
Gray Fox	44,000	147												300
Red Fox	44,000	88												500
Bobcat	44,000	183												240

\*List removals by Predator Animal Hunter.

\*List removals by Predator Animal Hunter.

REMARKS:

Reported by Garris

## INSTRUCTIONS

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

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

DISEASE

Refuge Carolina Sandhills NWR

Year 19 69

Botulism

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 \_\_\_\_\_

Lead Poisoning or other Disease

Kind of disease Trichomoniasis (Trichomonas gallinae)

Species affected Mourning Doves

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

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

Number lost 35 (Known)

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

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

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

Remarks Most of the infected individuals examined were adults, it was therefore safe to assume that many immatures succumbed before being captured, as it is known that the disease acts most severely in immature birds. Trapping success on the Refuge was down about 50%; undoubtedly at least partially due to the disease.

Refuge Carolina Sandhill National Wildlife Refuge Year 1969

Collections and Receipts (Seeds, rootstocks, trees, shrubs)							Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
Longleaf Pine							Comp. 2, st. 1000/ac. 91,104		22 ac.	22,000 <u>Pinus</u> <u>palustris</u>	1-69	Satisfactory	
Longleaf Pine							Comp. 4, st. 9,12,14,25	1000/ac.	96 ac.	96,000 <u>Pinus</u> <u>palustris</u>	1-69	Satisfactory	
Virginia Pine							Clay pits	1000/ac.	5 ac.	5,000 <u>Pinus</u> <u>Virginiana</u>	1-69	Satisfactory	
Longleaf Pine							Comp. 2, st. 1000/ac. 30,3,33,36,37		164 ac.	164,000 <u>Pinus</u> <u>palustris</u>	12-69	Satisfactory	

- (1) Report agronomic farm crops on Form NR-8  
(2) C = Collections and R = Receipts  
(3) Use "S" to denote surplus

Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Total acreage planted:

Marsh and aquatic \_\_\_\_\_  
Hedgerows, cover patches \_\_\_\_\_  
Food strips, food patches \_\_\_\_\_  
Forest plantings 287



Fish and Wildlife Service Branch of Wildlife Refuges  
CULTIVATED CROPS - HAYING - GRAZING

Refuge Carolina Sandhills County Chesterfield State South Carolina

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested		Unharvested				
			Acres	Bu./Tons	Acres	Bu./Tons			
Bahia Grass, Pensacola					254	1.5 Tons	254**		
Corn	42	2430 Bu	12	660 Bu	81	4240 Bu	135		
Lespedeza, Bicolor	38	2.3 Tons*	7	0.4 Tons*	15	1.3 Tons	60**		
Lespedeza, Japonica			6	0.4 Tons		0.3 Tons	6**		
Lespedeza, Sericea	21	1.3 Tons*	7	0.4 Tons*			28**		
Millet, Prose			5	100 Bu		100 Bu	5	Cortalaria(Cover Crop)	52
Rye, Abruzzi	200	3600 Bu				600 Tons (200 Bu)	200	Rye (Browse)	200
Soybeans	387	5345 Bu				387 Bu	387		
Wheat			10	100 Bu	135	705 Tons (775 Bu)	145	Wheat (Browse)	145
Watermelons	162	(Cleared land rented for \$2,258.60 (before trees are planted on it. )					162	Fallow Ag. Land	185

No. of Permittees: Agricultural Operations 15 Haying Operations 0 Grazing Operations 1

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
None				1. Cattle	7	84	\$35.00	7
				2. Other				
				1. Total Refuge Acreage Under Cultivation				1434
Hay - Wild				2. Acreage Cultivated as Service Operation				30

\*Estimated, seed haven't been cleaned & weighed. \*\*Permanent Crops - Upland areas kept open by mowing.

## REFUGE GRAIN REPORT

Refuge Carolina SandhillsMonths of Jan. 1 through Dec. 31, 19569

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Corn	400 Bu	660 Bu	1060 Bu			400 Bu	400 Bu	660 Bu		660 Bu	
Cortalaria	1200 Lbs		1200 lbs		800 lbs		800 lbs	400 lbs	400 lbs		
Lespedeza, Japonica		600 lbs	600 lbs					600 lbs	600 lbs		
Wheat	100 Bu	100 Bu	200 Bu		80 Bu	20 Bu	100 Bu	100 Bu	80 Bu	20 Bu	
Millet, Prose		100 Bu	100 Bu	100 Bu							

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

(9) Grain is stored at Refuge Headquarters and in Building No. 206.(10) Remarks Corn and wheat used for wildlife food and bait. Wheat also used for browse plantings. Cortalaria for Soil improvement. Prose millet transferred to dove research project.

\*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.

TIMBER REMOVAL

Refuge Carolina Sandhill National Wildlife Refuge Year ~~1968~~ Calendar Year 1969

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
Ansonville Lumber Co.	527-23-240	Comp. 1 St. 8,9, 16,31,32	230	Expressed in B.F. 729,257 B.F. 522.20 stand- ard cords	Lump Sum	\$42,966.82	Improvement cut	10% Longleaf 50% Loblolly 40% Pond
Coit Davis Logging Co	527-23-246	Comp. 1 St. 14,16, 18	63	73,790 B.F. 250.22 stand- ard cords	Lump Sum	5,703.55	Improvement cut	40% Longleaf 25% Loblolly 25% Slash 10% Pond
E. D. Pew Timber Co.	527-23-247	Comp. 3 St. 13	38	249 standard cords	\$10.65	2,653.25	Improvement cut	Longleaf
H. M. Hents & Son	527-23-282	Comp. 2,3, 5,6,8,10	283	1,963 standard cords	3.50	10,796.50	Ice Damage Pulpwood Salvage	Slash Longleaf
H. M. Hentz & Son	527-23-251	Comp. 1,2, 8,9,10	87	1,708 standard cords	6.50	11,102.00	Clearcut	Slash
Morgan Lumber Co.	527-23255	Comp. 4,5, 6,7	332	652,000 B.F.	35.00/M	22,820.00	Improvement cut	Slash Loblolly Longleaf Pond
Carrison Timber Co.	527-23-280	Comp. 5	150	1200 standard cords 73,000 B.F.	6.00	7,200.00	Pulpwood Salvage	Longleaf Loblolly
Koppers Co.	527-23-265 527-23-266	Comp. 6	956	Per pole	30.00/M Per pole basis	2,250.00 20,494.30	Improvement cut Poles	Pond Longleaf

Total acreage cut over..... Total income.....

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

3-1761  
Form NR-11  
(2/46)

TIMBER REMOVAL

\* Carolina Sandhill National Wildlife Refuge Year ~~XX~~ 19 Calendar Year 1969  
Refuge.....

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
Fred Gosnell	527-23-261	Comp. 7	76	153,045	30.00/M	4,591.35	Improvement cut	50% Loblolly 30% Longleaf 20% Pond
Callaway Timber Co.	527-23-279	Comp. 7,9, 10	330	2,107 standard cords	5.50	11,583.50	Pulpwood Salvage	25% Longleaf 75% Loblolly
Ward Pulpwood Co.	527-23-283	Comp. 7	33	394 standard cords	6.00	2,364.00	Clearcut	Slash
Ward Pulpwood Co.	527-23-285	Comp. 7	214	1,498 standard cords	5.50	8,239.00	Pulpwood Salvage	75% Longleaf 25% Loblolly
Swamp Fm. Lumber	527-23-275	Comp. 7,9	67	419 standard cords	6.00	2,514.00	Pulpwood Salvage	30% Loblolly 70% Longleaf
		Comp. 9	33	15,000 B.F.	30.00/M	480.00	Improvement cut	80% Longleaf 20% Loblolly
Rocky River Lumber	527-23-276	Comp. 6	25	113,510 B.F.	35.00/M	4,972.85	Clearcut	Slash

Total acreage cut over 2,968 Total income \$160,868.15

No. of units removed B. F. 1,311,602 Method of slash disposal

Cords.....  
Ties.....

\* Timber removed by the S. C. State Commission of Forestry



ANNUAL REPORT OF PERSTICIDE APPLICATION

Proposal Number  
2-69

Reporting Year  
1969

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
May 12 - Aug. 15 1969	Weed Trees primarily tur- key oak ( <u>Quer- cus laevis</u> )	Compartments 2, 3, 5, 6, 10, 11	3,103	4 lbs. acid equivalent low volatile ester 2-4-5,T	1,815 gal.	2.341 lbs./ acre	2 parts 2,4,5-T 1 part #2 diesel fuel 13 parts water	Tractor mounted Hurricane Mist Blow er, Model #32, con- stant blower pressure of 30 lbs and trac- tor speed of 2 mph at 25' intervals
Mar. 1 - Mar. 15 1969	Weed Trees primarily tur- key oak ( <u>Quer- cus laevis</u> )	Compartments 8, 10, 17	55	Dybar (Fenuron)	400 lbs.	7.3 lbs. / acre	None	Hand

10. Summary of results (continue on reverse side, if necessary)

Results of both chemical treatments was good. However, the older scrub oak stems made it necessary to apply the 2-4-5,T at a higher rate than in the past. Blowing was halted during windy conditions keeping the drift to a minimum.

3-1979 (NR-12)  
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Carolina Sandhills

ANNUAL REPORT OF PERSTICIDE APPLICATION

Proposal Number

Reporting Year

1-69

1969

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
June-July	Woody plants; scrub oaks, maples, willows, etc.	Dikes, food patches and lake edges; Martin Lake, Lake Joe, Lakes 16, 17, and 17, Chain Lakes, Drizzle Lakes and Chain Lakes	30	Isononyl Ester 2, 4, 5, Trichloro, monoacetic acid equivalent, 3, 3 lbs. per gal.	20 gallons	3 quarts per gallon of water	3 quarts of 2, 4, 5-T per 100 gallons of water	Handie Sprayer

10. Summary of results (continue on reverse side, if necessary)

A good kill on annual life and species was achieved in those areas treated.

# Area Paralyzed For Two Days

Hartsville and the area, virtually at a standstill after two days of being paralyzed by snow, sleet and ice, is slowly recuperating and with the thawing out comes a "clean up and clear up" period that will take weeks to complete.

## Deliver Baby By Flashlight

A real live soap opera was enacted at Byerly Hospital during the ice storm, complete with auxiliary generator failure, delivery of a baby by flashlight, plenty of cool thinking, and creative and efficient make-do.

It all began at about 2 a.m. Monday morning when city electricity went out and the hospital auxiliary generator started up, to last only ten minutes — and

See DELIVER, Page 7-A

Electric power posed the major problem, with current cut for two days and two nights in most places and some areas are still without electricity.

Lack of water caused much concern and consternation. The city's water supply stopped its flow Sunday night and was off in most areas about 24 hours, creating cooking problems for housewives, shaves for dad, baths and sanitation problems for all.

This is the first time in history, according to some of the oldest natives, that Hartsville has been without water pressure.

See RESTORATION, Page 6-A

## Schools Close

Florence County schools and most other schools in the Pee Dee were to be closed Monday in the wake of a severe winter storm that struck Saturday night.

Widespread loss of power in the county forced the closing, school officials said, as there was doubt the schools could be heated on the cold day expected.

Besides the county public schools, other closings Monday were:

- Darlington County schools.
- Dillon County schools.
- Marlboro County schools.
- The University of South Carolina at Florence.

- All Saints Episcopal Day School.

- James F. Byrnes Academy.

- St. Anthony's parochial school.

- The Florence-Darlington Area Technical Education Center.

Power officials said that some "isolated" cases would be without heat or lights for two or three days.

The biggest problem to families, though, was the loss of electric power.

With the electricity went the heat in hundreds of homes, and families sat huddled while power crews worked in freezing rain mixed with sleet.

In some cases, traffic lights were not working, making the extremely light traffic of the day a blessing.

Hospitals in Florence County and surrounding areas faced critical situations when power medical treatment facilities to cut off. Manual treatments had to be administered in some acute critical cases.

Hospital elevators were shut off during the electrical blackout, reported to be nearly two hours at McLeod Infirmary, and food trays were transported via candle lighted stairways.

Broadcasting stations in the Florence area were knocked off the air on occasion Sunday from loss of power.

At least 60 per cent of the Florence County citizenry and a neighboring eight-county area were estimated to be without lights or heat late Sunday, with conditions expected to worsen during the night.

Big areas of Florence had their power restored by late Sunday, but some remained without power throughout the night. Many sought refuge with relatives and friends.

The Civil Defense and Red Cross set up two disaster centers at McClenaghan and Wilson high schools Sunday afternoon to house persons without heat and power.

To show had bad things were, the disaster centers found themselves in the early evening without heat and power and were moved to the country agriculture building.

Dillon Wilkes, in charge of the agriculture building center, said only a handful of people had come down, but kept it open late in the night in case it was needed. He said light snacks were available there for refugees.

Sam Harrelson, superintendent of lines of the southern division of Carolina Power and Light Co., said late Sunday that assisting line crews had been called from North Carolina and the coastal area of South Carolina. Some 55 line crews, or 500 linemen, are working day and night to correct the massive power losses which struck the Pee Dee, he said.

Harrelson termed the lay storm "one of the worst disasters" to hit eastern South Carolina in 23 years.

He said the nine-county area serviced by the southern division of CP&L includes Florence, Darlington, Dillon, Horry, Clarendon, Marlboro, Chesterfield, and Sumter counties.

The division superintendent said the damage is not centralized in any of the counties and that "all of them are in real critical shape. I couldn't say that Florence or any particular area is hurt worse," he said.

"Everybody we talk to in the districts seem to feel everybody is in about the same shape," Harrelson said most of the trouble was caused by ice-laden falling trees. He called the estimates of damage "horse back estimates" which would have to be borne out later.

"We are really trying to get the power restored," he said. "Line crews will be working all night and all day tomorrow. We will have to give them a rest tomorrow night," he added.

"We need about 50 more people to help rush the work along and we expect to get them tomorrow morning," Harrelson said.

Florence Police Chief Melvin Adams said that falling trees, power lines, and telephone

# State Still Reeling From Winter Blast

## From Staff and Wire Reports

With most of the state still reeling under the onslaught of a mid-winter storm Sunday evening, the weather bureau refused to lift hazardous driving warnings across the state and forecast more foul weather through today.

A low pressure system located off the coast was responsible for the inclement weather. It is expected to move slowly to the east and away from South Carolina today.

Predictions call for the rain and snow to end by this morning, but temperatures will continue to remain low and skies will stay cloudy. Highs will be near 40.

## WARNINGS

Travelers warnings were in effect from northern Georgia through North Carolina Sunday night.

By late Sunday afternoon snow depths in South Carolina ranged from one inch in the lowlands to more than six inches in most areas in the Piedmont and mountains.

Downtown Spartanburg reported 8 inches at 5 p.m. There was even a trace of snow along the coast.

Ships anchored just off the Charleston Coast were forced to go to sea to ride out the storm. Winds along the coast were expected to reach 30 to 55 mph Sunday afternoon. Coastal tides ran two feet above normal Sunday morning.

Several areas in the northern and western sections of the

state reported damage to trees and power lines from ice accumulations.

## IMPASSABLE

Some roads and bridges in the northwestern section were impassable because of snow and ice. The State Highway Department cautioned that conditions would continue to be dangerous through today.

At Columbia Metropolitan Airport Sunday, air travel was virtually at a standstill.

A Delta flight came in at 3:30 p.m. and an Atlanta flight set for 3:55 p.m. was rescheduled for 7 p.m., but clerks admitted that it probably would not take off.

There were many people moving about restlessly in the terminal, but it was believed that many businessmen had resigned themselves to conditions and settled down in motels.

One woman appeared at 7 a.m. Sunday awaiting her hus-

band who was in Atlanta on the last leg of his trip from Vietnam.

At 3 p.m. the woman cheered when word arrived that her soldier-husband was coming by bus from Atlanta. She departed hurriedly.

## FLIGHTS CANCELLED

All Eastern flights were cancelled and it was doubtful if any other planes would leave Sunday.

"As soon as we de-ice a plane," one spokesman said, "it

freezes up again. We're taking no chances."

Meanwhile, the coffee shop and reading stand were doing a landslide business.

On Saturday the Columbia city police recorded 41 minor accidents in the city, 32 between 3 and 11 p.m.

As of 4:30 Sunday only 5 accidents had been reported. All resulted in minor damage and no serious injuries were reported.

The Richland County Sheriff's Department had investigated

(See HAZARDOUS, 7-A, Col. 4)



# Timber Salvage Plans Made

By J. C. WILLIS  
County Agent

South Carolina forestry officials and county agents met Monday at the Sandhill State Forest at Patrick to complete plans to salvage and utilize the \$60 million in timber damaged by ice recently.

This damage covers Chesterfield, Marlboro, Darlington, and Kershaw counties in South Carolina, Chesterfield County suffering the greatest damage.

The Forestry Commission has assigned five foresters to work with land owners in Chesterfield County to assist and advise them as to what they should do with their timber.

With so much timber now being salvaged, it will be to the landowner's advantage to wait to market that part of your timber which will live for ten or twelve months. The trees now down must be salvaged shortly.

The best way to determine what you should do with your timber is to have one of these foresters check your timber and advise you. This service is being offered at no cost to the landowner. If you would like to place your name on the list, you may call the County Agent's office at 343-2131.

When you are visited the forester will supply you with a sales contract and a list of the buyers in this area. He will also file at the Sandhill State Forest headquarters at Patrick the number of cords of pulpwood and the number of board feet of saw timber on your tract.

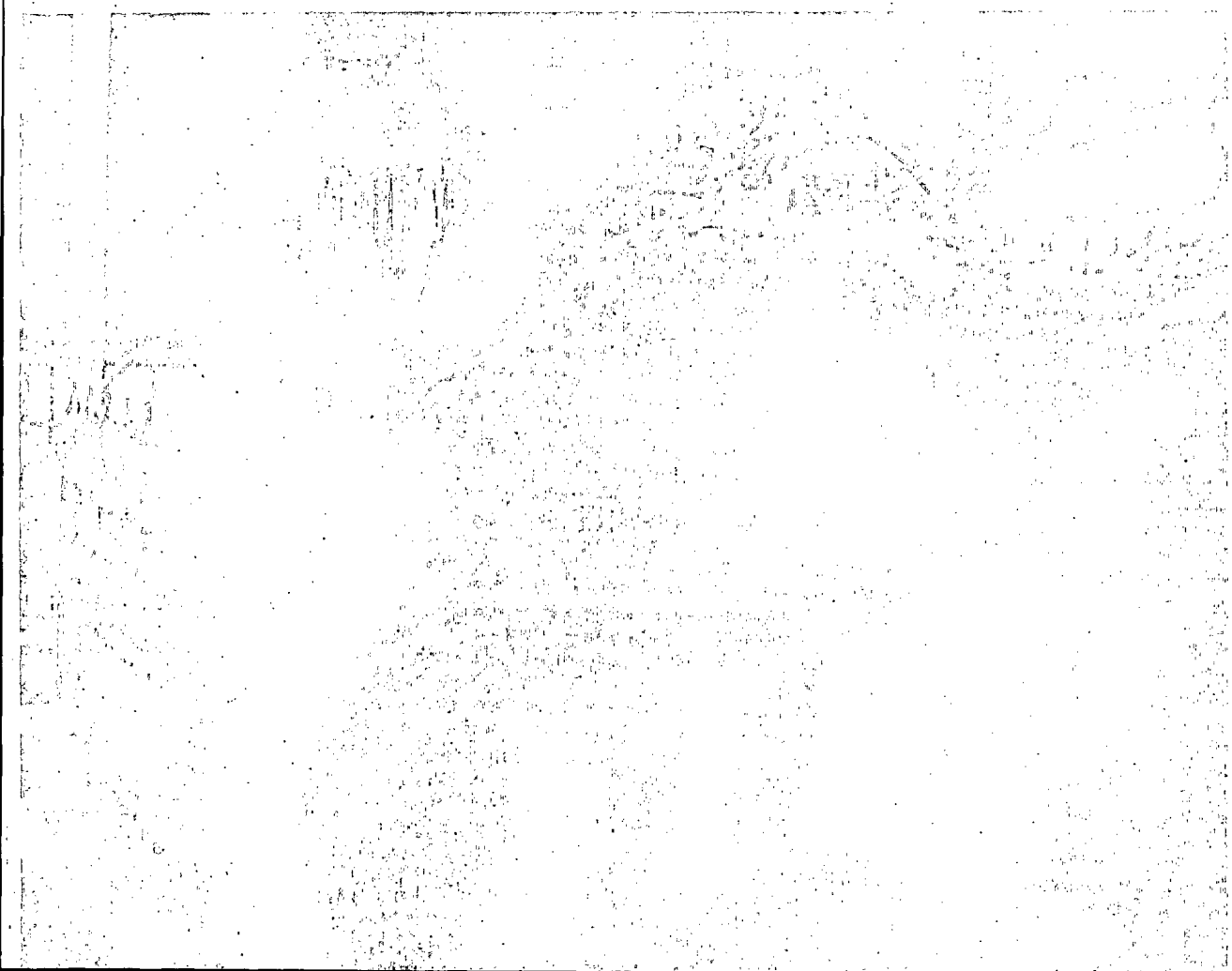
The forest officials assigned to this area will assist you in marketing this timber.

Governor McNair, State forestry officials, as well as others, are attempting to relieve the situation by getting mills, that normally do not buy in this area, to purchase some of this salvaged timber. Efforts are being made to bring pulpwood cutters from other areas in to assist with this harvesting of timber.

However, summing up the situation, the prospects right now look rather dim for salvaging all the damaged timber in time.

COVERED BY THE PRESS

# Storm Tosses Icy Weather In Malmette State Area



## Power Service Cut Many Trees Down

Snow, sleet and ice paralyzed the Pee Dee day after a winter storm dumped icy precipitation on South Carolina Saturday night.

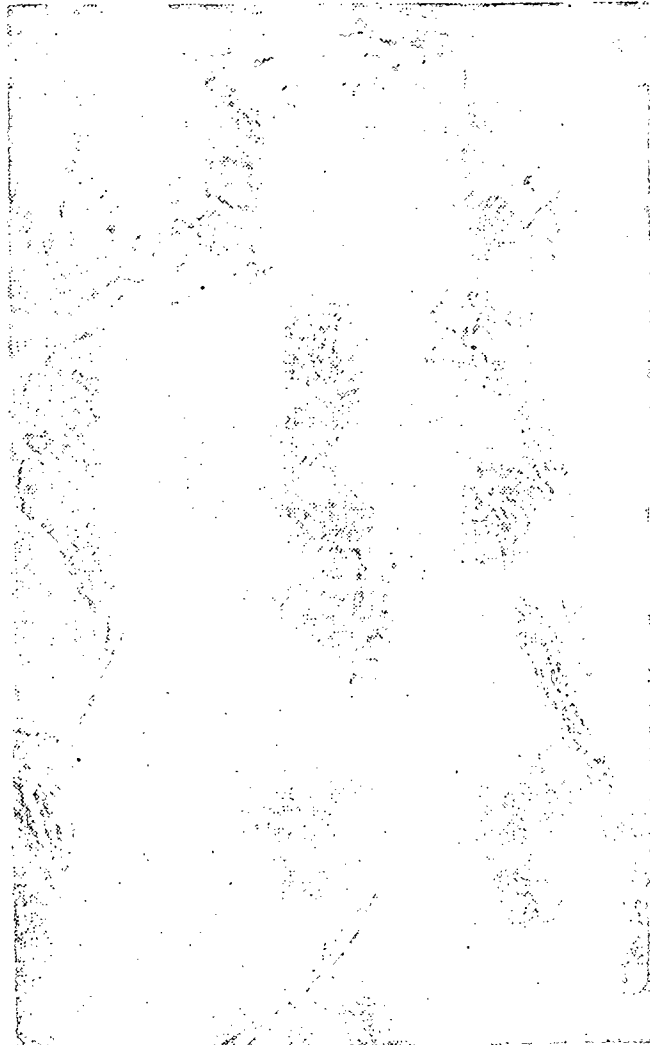
Icy loads and high winds Saturday night broke countless tree limbs. On the way down, many of them carried power and telephone lines, leaving hundreds of people without power and heat through the day.

On Sunday, many churches did not hold morning services, and most churches apparently canceled evening services.

Hazardous driving warnings were issued Saturday night and remained in effect into Monday. Icy streets and roads and falling limbs and wires were the big problem to motorists.

Police departments and the Highway Patrol said traffic had been relatively light since the ice appeared and there were only minor accidents. A few cars in ditches around Dillon County was the biggest problem, the Police Department said there.

Schools around the Pee Dee announced they would close Monday, and Wentworth Manufacturing Co., among its plants in Florence and City would close.



FLOWER OF ICE

Flowers and shrubs were hard hit by the falling temperatures. This camellia wears a mantle of ice.

## Cleanup Effort Begins

By LEVERNE M. PROSSER  
Pee Dee Bureau

An army of men worked through the night to restore service to persons cut off from electric power and telephone service by a weekend snow and sleet storm that left the eastern half of South Carolina caked with ice.

Losses were estimated in the millions of dollars to utility lines, pulp wood acreage, homes, automobiles and some commercial buildings damaged by falling trees and limbs.

Thousands of persons were pressed into a massive effort to clear downed trees and mangled utility wires from ice-covered highways that bottled up traffic across the upper Pee Dee most of Monday.

The Florence Cablevision System was left in shreds, and

Pictures, Story

... See Page 1-B

it will take weeks to get the half-million dollar facility completely back in service.

The 600-foot cablevision tower buckled into a spaghetti-like pile of aluminum and steel atop the system's control station, and wires used to carry its signals throughout Florence were segmented into thousands of pieces.

Telephone service remained out late last night for about one-fourth of the Pee Dee's population, most of the phone lines in Nichols, Society Hill, Red Hill, Bethune, Turbeville, Pamplico, Dillon, Lake View and adjacent rural areas were out.

As many as half of the phones in such places as Dillon, Bennettsville, Hartsville, Darlington, Lake City, Sumter, Timmonsville, Olanda, Marion, Cheraw and Chesterfield are not expected to be returned to service until sometime today.

More than 300 men were called in to help Carolina Power and Light Company (CP&L) get electricity flowing back into the homes of some 50,000 families without power for most of Sunday and Monday.

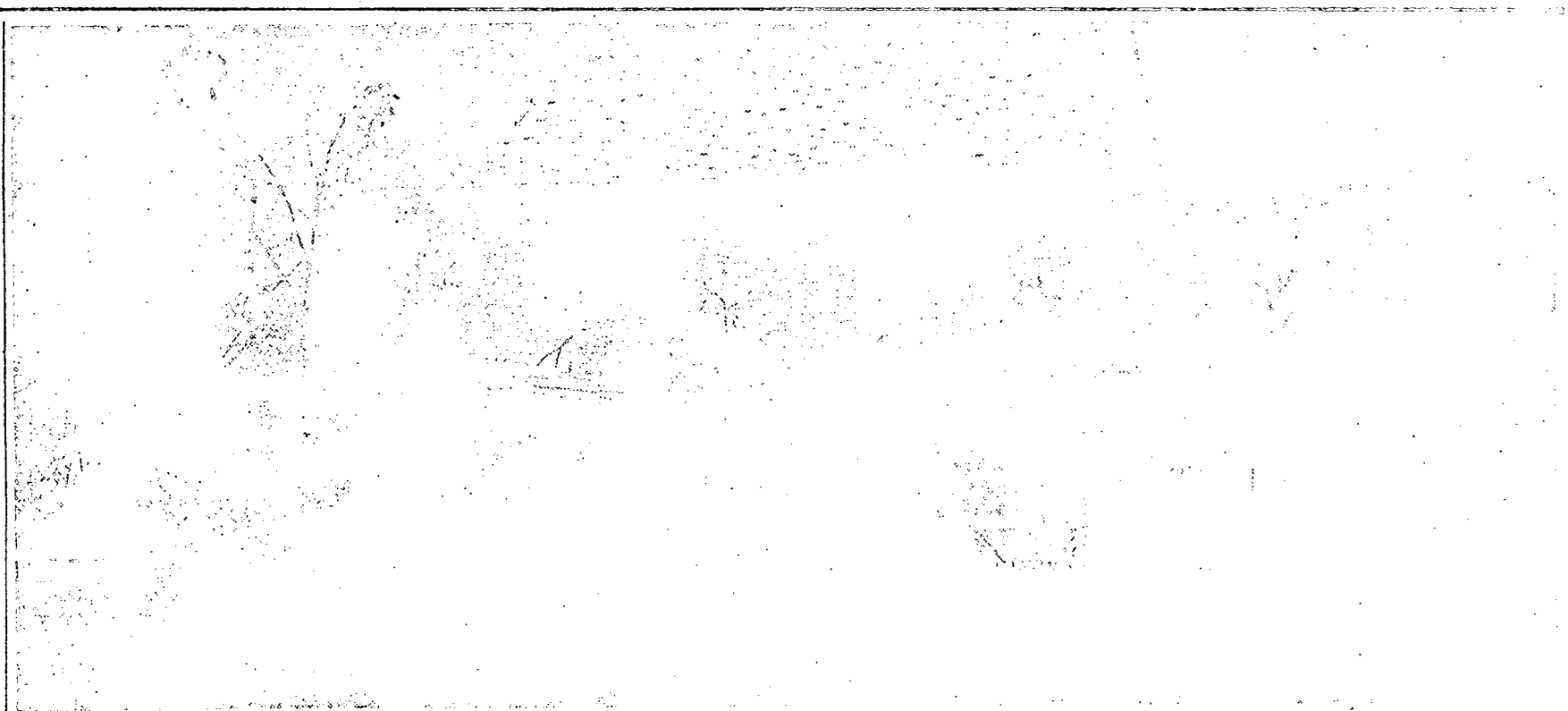
"It was the worst storm on our transmission lines in our 60-year history," said E. M. Geddie, asst. vice president in the CP&L operating and engineering department. Geddie said about 10,000 square miles of CP&L's 30,000 mile area were affected by the power failure.

"We're working as hard as we can. I don't know when it will be completely corrected, probably tomorrow or even later," he said.

About 50 per cent of CP&L's lines were back into service late last night, and it probably will take several days for all homes to be back on the line.

Crews were put into action

(See STORM, Page 2-A)



#### OAK TREE SPLITS UNDER WEIGHT OF ICE IN PEE DEE

While trees were toppled and limbs were torn away by the ice in the Florence area, few of them split as this one did. Crews already have been working, cutting away the branches so the debris can be cleared from the street. (Photos by Prosser)

# State Storm Losses Estimated In Millions

Power pole leans precariously in Chesterfield residential area.

## The Aftermath

## Destruction Viewed

Coming through Chesterfield County like an angry god, the gleaming, silent, white monster snapped power poles, snatched down lines, uprooted trees or ripped them apart, stripping limbs and strewing them across roads, atop dwellings, upon lawns and vehicles.

Chesterfield, Cheraw, Ruby, Mt. Croghan, Patrick, York and Lancaster are still in living memory of the snow, sleet and freezing rain accumulated Saturday and Sunday and Monday in a widespread blizzard that hit this county hardest through the center and at its eastern end.

Carolina Power and Light Company reported approximately 100,000 homes serviced by them in North and South Carolina were without power beginning late Sunday. A 10,000 square-mile area was blanketed out,

and although the power company expected to restore power in most cases by late Tuesday, numerous customers would suffer longer before work crews could repair damages to individual lines.

CPL said they were the worst hit this year than in all 60 years of operation.

Lynch's River Electric Cooperative, serving parts of Chesterfield, Kershaw and Lancaster counties, said their damages were disastrous. The three-phase line from Chesterfield had to be rebuilt. It could be days yet before many rural residents have power restored.

Ninety percent of the power poles between Chesterfield and Patrick were torn up. Patrick was without power from approximately 8:45 Sunday morning, but its 150,000 gallon water tank was expected to hold out.

Chesterfield's power went off at 11:00 a.m. and forty minutes later, and Chesterfield ran out of water with no electricity to run the pump. Telephones were dead. The town froze still, and on Monday and Tuesday only one or two businesses operated.

Hardware stores sold portable heaters, lamps, globes, wicks, kerosene, candles — anything to dispel the darkness, bring heat to frigid homes and provide some method for preparing food.

Cars lined up for quarter of a mile at service stations to fill up with gas, as power failures began putting pumps out of order.

Food stores operated as best they could without lights.

Up to eight inches of snow and sleet were reported in the Pee Dee area, and this county suffered severe damages as the storm moved across Florence and Hartsville and into eight or ten counties of the two states.

"Cheraw was tore to pieces," someone said in Chesterfield Tuesday. "It looks like World War II." Telephone contact could not be made from Chesterfield to Cheraw at that time, but it was also learned the county hospital had been operating on auxiliary power and was "getting by."

known how many homes were damaged. Some streets were impassable. Lines dangled everywhere.

"Limbs popping sounded like rifles cracking," a resident remarked.

Several awnings in town and at homes gave way.

Although no official reports are in, damages in Chesterfield County alone must run in millions of dollars.

Page-land may be the hardest hit this year as in the January snow and ice storm of 1966, though it fared better compared to the other county towns. Page-land and Jefferson were without power parts of Sunday, Monday and Monday night.

It was reported Cheraw National Guardmen were helping direct traffic all over town, as stop lights were out and giant trees had fallen on power lines.

There was talk in Chesterfield of its armory being turned into an emergency station. When this news story was being written it was not known how long Chesterfield would be without power, whether a generator could be got to power the water pump, or when schools in the area might be opened.

At least one injury had been reported. Chuck Lear's mother had fallen and was taken to county hospital, but the extent of her injuries were not reported.

Chesterfield Boy Scouts began a heroic effort Sunday afternoon to clear streets and haul wood to families needing fuel. With chain saws, axes and whatever tools could be had, the boys and their Scoutmaster, Jim Braswell, sawed felled trees into logs and hauled them on pickup trucks bearing the signs, "free wood." They also worked to deliver food, candles and other supplies to the stricken residents.

Ivy Mill in Chesterfield, a heavily wooded residential area, was completely littered with fallen trees and limbs. It was not

It was reported that Jefferson suffered more damage in this year's storm.

In these towns, too, awnings buckled under the weight of ice and snow, barns caved in, as well as chicken and turkey houses, exposing flocks to cold and death.

By Tuesday much of the snow and ice had melted away beneath warmer, sunny skies, and higher temperatures were predicted.

However, recovering from the crippling storm will take many weeks.



# N.C.-S.C. Ice Storm Damages To Cost Hundreds Of Millions

By BOB GLENDY

News Monroe Bureau

HAMLET — Damages from an ice storm which straddled the North and South Carolina border early last week are expected to run into the hundred of millions of dollars by the time it can all be totaled up.

A heavy deposit of ice broke tree limbs, downed power lines and transmission towers and left more than 100,000 homes and businesses without power. Large numbers of homes in rural areas are still without power and

may have to do without at least through the weekend.

"It will be from three to six months before we can actually tell just how much damage has been done," said one power company official.

"We are trying to restore service as fast as possible, but there are still many areas where we will have to go back and make the repairs on a permanent rather than an emergency basis," he added.

The storm which dumped 12-15 inches of water on wide areas of North Carolina hit Anson, Richmond and Scotland counties in North Carolina and Chesterfield, Marlboro, Florence and Darlington counties in South Carolina, with ice which literally devastated a 10,000 square mile area of the two states.

THOUSANDS OF FAMILIES have been without power since 11:40 p.m. Feb. 9. Kerosene lamps and candles provided light, while oil heaters did double duty as stoves for cooking and to provide heat.

Many used their back porches as a refrigerator or deep freeze until the power was restored or the food spoiled and had to be thrown away.

Much of the area today appears to have been bombed with trees uprooted but mostly snapped off 10-20 feet above the ground. Some of the older trees had every branch with the exception of a few at the top.

Power lines still drag the ground everywhere. Sections of wire lie in the highway like a dead snake. Power and telephone poles lie where they have fallen, snapped off at ground level or about halfway up.

Poles that escaped breaking lean dangerously with wires sagging near the ground. Others have crookedly dangling like broken twigs.

Carolina Power and Light Co. reports that 27 transmission towers in one three-mile stretch were crumpled to the ground by the weight of the ice. More than 10 miles north of Hamlet, poles carrying communications lines along the Seaboard Coastline tracks are down or sagging and no one seems to know how far south the damage extends.

Special crews from as far north as Baltimore, Md. and as far south as Florida are still working day and night to repair the damage, but several thousand families in outlying areas will just have to wait until they can get around to them.

FILE COPY

REFUGE Carolina Sandhills NWR

MONTHS OF May 1 TO August 31, 1969

[illegible]

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

WATERFOWL  
 (Continuation Sheet)

REFUGE Carolina Sandhills NWR

MONTHS OF May 1 TO August 31, 19 69

(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	20	20	20	20	20	20	20	20	2,294	3	12
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	1050	1100	1100	1150	1200	1100	1000	1000	125,150	45	450
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
<u>Coot:</u>											

(Over)

	(5)	(6)	(7)		SUMMARY
	Total Days Use	Peak Number	Total Production		
Swans	_____	_____	_____	Principal feeding areas	<u>Martins Lake, Wooded Impoundments,</u>
Geese	<u>2,294</u>	<u>22</u>	<u>12</u>		<u>and Ox Pen.</u>
Ducks	<u>125,150</u>	<u>1200</u>	<u>150</u>	Principal nesting areas	<u>Wooded Impoundments, Ox Pen,</u>
Coots	_____	_____	_____		<u>and Lake 16.</u>
				Reported by	<u>Garris, Howe, Rogers, Morrison</u>

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 NWR

Months of May 1

to August 31

19 69

(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>											
Pied Billed Grebe		4	May 1	25	7/15-8/31	3	Present			Unknown	1,800
Great Blue Heron		1	May 1	15	5/1-8/31	2	Present			"	1,100
American Egret		6	June 25	30	July	7	Present			"	1,800
Little Blue Heron		2	July	10	7/15-8/31	2	Present			"	600
Green Heron		2	May 1	35	5/1-8/31	1	Present			"	1,800
II. <u>Shorebirds, Gulls, and Terns:</u>											
Spotted Sandpiper		5	May 17			3	June 5				2,600

(over)



(1)	(2)		(3)		(4)		(5)		(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	5,000	May	15,000	July-Aug.	6,000	August		3,500	861,000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	1	8/28	1	August	1	Present			
		Present	55	August		Present			6,100
	30	May	1,200	May	1,200	August		400	110,700

Reported by Garris, Howe, Rogers

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.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
BUREAU OF SPORT FISHERIES AND WILDLIFE  
WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Carolina Sandhills NWR

For 12-month period ending August 31, 1969

Reported by Garris

Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat			(3) Use-days	(4) Breeding Population	(5) Production
	Type	Acreage				
NORTHERN ZONE	Crops	200	Ducks	39,695	60	50
	Upland	12,000	Geese			
	Marsh		Swans			
	Water	90	Coots			
	Total	12,290	Total	39,695	60	50
CENTRAL ZONE	Crops	1,175	Ducks	510,367	830	132
	Upland	19,275	Geese	121,835	6	12
	Marsh		Swans			
	Water	295	Coots			
	Total	20,745	Total	635,202	836	144
SOUTHERN ZONE	Crops	229	Ducks	17,012	10	10
	Upland	11,730	Geese			
	Marsh		Swans			
	Water	17	Coots			
	Total	11,976	Total	17,012	10	10
TOTAL	Crops	1,604	Ducks	567,074	900	192
	Upland	43,005	Geese	121,835	6	12
	Marsh		Swans			
	Water	402	Coots			
	Total	45,011	Total	691,909	906	504
	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 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.

(April 1946)

## UPLAND GAME BIRDS

Refuge **Carolina Sandhills NWR**

Months of May 1 to August 31, 19<sup>69</sup>

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White Quail	44,000*	18	60	500	50/50	N	O	N E	2,500	Information collected while on routine Patrol.
Eastern Wild Turkey	44,000*	880	0	10	50/50	N	O	N E	50	
*Upland areas including 1500 acres of farmland and open areas. The rest is scrub oak, bottomland hardwood and pine.										

FILE COPY

## WATERFOWL

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF May 1 TO August 31, 19 70

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

WATERFOWL  
(Continuation Sheet)

REFUGE Carolina Sandhills National Wildlife Refuge

MONTHS OF May 1

TO August 31, 19 70

(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	28	28	28	28	28	28	28	28	3513		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard											
Black											
Gadwall											
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood	1200	1300	1300	1200	1200	1100	1800	1800	151100	49	560
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

(Over)

	(5) <u>Total Days Use</u>	:	(6) <u>Peak Number</u>	:	(7) <u>Total Production</u>		<u>SUMMARY</u>
Swans		:		:		Principal feeding areas	<u>Martins Lake, Black Creek,</u>
Geese	<u>3,513</u>	:	<u>31</u>	:			<u>and wooded impoundments</u>
Ducks	<u>151,400</u>	:	<u>1800</u>	:	<u>580</u>	Principal nesting areas	<u>Wooded impoundments, Lake 16.</u>
Coots		:		:			<u>and Black Creek.</u>
						Reported by	<u>Garris</u>

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 NWR

Months of May 1

to August 31

19 70

(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
<b>I. Water and Marsh Birds:</b>											
Pied Billed Grebe		6	May 1	30	7/15-8/15	5	Present				2,400
Great Blue Heron		1	May 1	12	5/1 -8/31	2	Present				1,200
American Egret		2	June 20	20	7/15-8/31	5	Present				1,200
Little Blue Heron		2	June 20	10	7/15-8/31	4	Present				600
Green Heron		1	May 1	30	5/1-8/31	3	Present				2,400
<b>II. Shorebirds, Gulls, and Terns:</b>											
Spotted Sandpiper		7	May 1			5	June 3				2,400

(over)

	(1)	(2)	(3)	(4)	(5)	(6)		
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	6000	May	17,000	July-Aug.	7000	August	4000	976,000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow		Present	50	August		Present		86,100
	35	May 1	1,300	May	1300	August	500	122,000

Reported by Garris

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

For 12-month period ending August 31, 1970

Reported by Garris

Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat			(3) Use-days	(4) Breeding Population	(5) Production
	Type	Acreage				
NORTHERN ZONE	Crops	200	Ducks	60,500	80	55
	Upland	12,000	Geese			
	Marsh		Swans			
	Water	90	Coots			
	Total	12,290	Total	60,500	80	55
CENTRAL ZONE	Crops	1,175	Ducks	772,808	900	593
	Upland	19,275	Geese	99,573	6	3
	Marsh		Swans			
	Water	295	Coots			
	Total	20,745	Total	872,381	906	596
SOUTHERN ZONE	Crops	229	Ducks	30,200	20	12
	Upland	11,730	Geese			
	Marsh		Swans			
	Water	17	Coots			
	Total	11,976	Total	30,200	20	12
TOTAL	Crops	1,604	Ducks	863,508	1000	660
	Upland	13,005	Geese	99,573	6	3
	Marsh		Swans			
	Water	102	Coots			
	Total	15,011	Total	963,081	1006	663
	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)

3-1752  
(Form NR-2)  
(April 1946)

UPLAND GAME BIRDS

Refuge Carolina Sandhills National Wildlife Refuge

Months of May 1 to August 31, 1970

(1) Species  Common Name	(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 observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White Quail	6,300	2.1	70	800	50/50	N	O	N	3,000	Information collected while on routine patrol and road- side counts.
Eastern Wild Turkey	26,400	660	1	8	50/50	N	O	N	40	



3-1750  
Form NR-1  
(Rev. March 1953)

# WATERFOWL

REFUGE Carolina Sandhills NWR

MONTHS OF January 1 TO April 30, 1969

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	900	900	1200	1600	1400	1400	1200	1000	900	900
Cackling										
Brant										
White-fronted										
Snow			2							
Blue	2	2	2	2	1	1	1	1	1	1
Other										
Ducks:										
Mallard	1550	1550	1400	1400	800	800	500	500	500	500
Black	1100	1100	1000	1000	500	500	300	300	300	300
Gadwall										
Baldpate	100	100	100	100	100	100	100	100	100	100
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood	1000	1000	1000	1100	1100	1100	1100	1100	1100	1000
Redhead										
Ring-necked	50	50	50	50	50	50	50	50	50	200
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										

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

WATERFOWL  
 (Continuation Sheet)

REFUGE Carolina Sandhills NWR

MONTHS OF January 1 TO April 30, 1969

(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	100								77,800		
Cackling											
Brant											
White-fronted											
Snow									14		
Blue									92		
Other											
Ducks:											
Mallard	400	200							66,050		
Black	200	100							43,600		
Gadwall											
Baldpate	50	50							7,400		
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood	1100	1100	900	900	900	900	900	900	121,700	7	42
Redhead											
Ring-necked	50	50							5,100		
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

(Over)

	(5)	(6)	(7)	SUMMARY
	<u>Total Days Use</u>	<u>: Peak Number</u>	<u>: Total Production</u>	
Swans	_____	_____	_____	Principal feeding areas <u>Martins Lake, Ox Pen,</u>
Geese	<u>77,906</u>	<u>1602</u>	_____	<u>and Wooded Impoundments</u>
Ducks	<u>243,850</u>	<u>3800</u>	<u>42</u>	Principal nesting areas <u>Lake 16 and Wooded Impoundments.</u>
Coots	_____	_____	_____	_____
Reported by <u>Garris, Rogers, &amp; Morrison</u>				

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 NWR

Months of January 1

to April 30

19 69

(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
<u>I. Water and Marsh Birds:</u>										
Great Blue Heron	1	Jan. 1	8	April	1	Apr. 28				720
Green Heron	3	Mar. 7	8	April	1	Apr. 30				480
Pied Billed Grebe	4	Mar. 7	15	April	2	Apr. 28				1200
<u>II. Shorebirds, Gulls, and Terns:</u>										
Spotted Sandpiper	10	March	60	April	3	Apr. 28				3600

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	6500	Jan	6500	Jan	4500	April	900	600,000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	2	Jan 1	2	Jan - Feb	1	Mar. 14		146
			50					6,000
	50	Jan 15	1200	April	25	April 28	300	108,000

Reported by **Garris**

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.

3-1752

(Form NR-2)

(April 1946)

## UPLAND GAME BIRDS

Refuge **Carolina Sandhills NWR**

Months of January 1 to April 30, 19 69

(1) Species	(2) Density	(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White Quail	44,000*	22	0	0	50/50	N	O	N	2,000	Information collected while on routine patrol.
Eastern Wild Turkey	44,000*	1100	0	0	50/50	N	O	N	40	
*Upland areas including 1500 acres of farmland. The rest is scrub oak, bottomland hardwood and pine.										



3-1754  
Form NR-4  
(June 1945)

SMALL MAMMALS

Refuge Carolina Sandhills NWR

Year ending April 30, 1969

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5)  Total  Popula-  tion
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control*	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
								Permit Number	Trappers' Share	Refuge Share				
Raccoon	44,000	49												900
Beaver	4,000	11												360
Mink	4,000	133												30
Otter	4,000	111												35
Muskrat	4,000	100												40
Opposum	44,000	733												60
Skunk (Stripped)	44,000	200												220
Gray Squirrel	44,000	73												600
Fox Squirrel	44,000	88												500
Gray Fox	44,000	147												300
Red Fox	44,000	88												500
Bobcat	44,000	183												240

\*List removals by Predator Animal Hunter.

\*List removals by Predator Animal Hunter.

REMARKS:

Reported by Garris

## INSTRUCTIONS

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

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

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U.S. FISH & WILDLIFE SERVICE  
BUREAU OF LAND MANAGEMENT  
DENVER, COLORADO

## WATERFOWL

REFUGE     **Carolina Sandhills National Wildlife Refuge**

MONTHS OF January 1 TO April 30, 19 70

[illegible]

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

WATERFOWL  
 (Continuation Sheet)

REFUGE Carolina Sandhills

MONTHS OF January 1 TO April 30, 1970

(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	35	32	34	31	31	31	31	31	58,190	1	3
Cackling											
Brant											
White-fronted											
Snow											
Blue	1	1	1	1	1	1	1	1	54		
Other											
Ducks:											
Mallard	35	10	10						98,745		
Black	25								81,755		
Gadwall											
Baldpate		10							7,625		
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood	1400	1400	1400	1200	1100	1100	1100	1100	208,900	11	80
Redhead											
Ring-necked	5								5,935		
Canvasback											
Scaup		9							63		
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

(Over)

	(5) Total Days Use :	(6) Peak Number :	(7) Total Production :	SUMMARY
Swans	_____	_____	_____	*Principal feeding areas <u>Martins Lake area, Ox Pan area,</u>
Geese	<u>58,244</u>	<u>1300</u>	<u>3</u>	<u>Black Creek and the Wood Impoundments</u>
Ducks	<u>402,960</u>	<u>7550</u>	<u>80</u>	Principal nesting areas <u>Black Creek and the Impoundments</u>
Coots	_____	_____	_____	_____

Reported by Garria, Howe, Rogers, & Morrison

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 SandhillsMonths of January 1 to April 30 19 70

(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
<b>I. <u>Water and Marsh Birds:</u></b>											
Great Blue Heron		1	Jan. 1	10	April	1	April 30				960
Green Heron		1	Jan. 1	10	April	2	April 27				840
Pie Billed Grebe		5	Jan. 13	15	April	3	April 27				1200
<b>II. <u>Shorebirds, Gulls, and Terns:</u></b>											
Spotted Sandpiper		3	Mar. 3	60	April	5	April 27				4800

(over)



(1)	(2)		(3)		(4)		(5)		(6)
II. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	6000	Jan.	7000	Jan.	5000	April		1000	660,000
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	1     30	Jan. 1     Jan. 11	1  50   1000	Jan-Feb.    April	1    15	Feb. 3    April 15		    250	10 4800  96,000

Reported by Garris, Howe, Rogers, & Morrison

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.

3-1752  
(Form NR-2)  
(April 1946)

UPLAND GAME BIRDS

Refuge Carolina Sandhills

Months of January 1 to April 30, 1970

(1) Species	(2) Density		(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods observed	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.	
Bob White Quail	6,300	2.5	0	0	50/50	N	O	N	2500	Information collected on Road-side counts and turkey gobbling counts.	
Eastern Wild Turkey	26,400	660	0	0	60/40 M/F	N	O	N	40		

3-1754  
Form NR-4  
(June 1945)

SMALL MAMMALS

Refuge Carolina Sandhills

Year ending April 30, 1970

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5) 
Common Name	Cover Types & Total Acreage of Habitat	* Acres Per Animal	Hunting	Fur Harvest	Predator Control*	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Popula- tion
								Permit Number	Trappers' Share	Refuge Share				
Raccoon	18,000	19												950
Beaver	1,900	5												360
Mink	1,200	40												30
Otter	1,200	34												35
Muskrat	800	20												40
Opposum	26,400	528												50
Skunk	26,400	106												250
Gray Squirrel	12,400	28												450
Fox Squirrel	24,000	48												500
Gray Fox	26,400	132												200
Red Fox	30,400	61												500
Bobcat	30,400	122												250

\*List removals by Predator Animal Hunter.

\*List removals by Predator Animal Hunter.

REMARKS:

\*Rounded off to the nearest whole number

Reported by Garris & Rogers

## 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.)

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