

ANNUAL REFUGE NARRATIVE REPORT
CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE
FISCAL YEAR 1974
McBee, South Carolina



CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE
McBee, South Carolina

NARRATIVE REPORT
FISCAL YEAR 1974

PERSONNEL

George R. Garris (Departed this Station 8/74)	Refuge Manager
Marvin T. Hurdle (EOD 8/74)	Refuge Manager
Ronnie L. Shell	Assistant Refuge Manager
James E. Howe (Departed this Station 10/73)	Forester
David H. Robinson (EOD 2/74)	Forester
Roy F. Rogers	Biological Technician
Olin Morrison	Biological Technician
Bonnie Kay Warr	Clerk-Typist
Ellice L. Sweeney	Laborer

CONTENTS

	<u>Page No.</u>
I. General.....	1
A. Weather Conditions.....	1
B. Habitat Conditions.....	2
1. Water.....	2
2. Food and Cover.....	3
II. Wildlife.....	3
A. Migratory Birds.....	3
B. Upland Game Birds.....	5
C. Big Game Animals.....	6
D. Fur Animals, Predators, Rodents and Other Mammals...	6
E. Hawks, Eagles, Owls, Crows and Black Birds.....	7
F. Other Birds.....	7
G. Fish.....	9
H. Reptiles.....	10
I. Disease.....	11
III. Refuge Development and Maintenance.....	11
A. Physical Development.....	11
B. Plantings.....	12
1. Aquatics and Marsh Plants.....	12
2. Trees and Shrubs.....	12
3. Upland Herbaceous Plants.....	13
4. Cultivated Crops.....	13
C. Collections and Receipts.....	14
1. Seeds or Other Propagules.....	14
2. Specimens.....	14
D. Control of Vegetation.....	14
E. Planned Burning.....	14
F. Fires.....	14
IV. Resource Management.....	15
A. Grazing.....	15
B. Haying.....	15
C. Fur Harvest.....	15
D. Timber Removal.....	15
V. Field Investigation or Applied Research.....	20
A. Progress Report.....	20
VI. Public Relations.....	22
A. Recreational Use.....	22
B. Refuge Visitors.....	23
C. Refuge Participations.....	23
D. Public Hunting.....	24
E. Violations.....	25
F. Safety.....	26
VII. Other Items.....	26
A. Items of Interest.....	26

ANNUAL NARRATIVE REPORT
CAROLINA SANDHILLS NATIONAL WILDLIFE REFUGE

FISCAL YEAR 1974

I. General

A. Weather Conditions

The fiscal year started off with heavy rains. Constant rainfall throughout much of the summer caused severe erosion on roads and farm fields. During the many summer thunderstorms, lightning strikes occurred all over the sandhills and killed a number of longleaf pines. On the plus side the abundant summer moisture helped insure a good corn crop for wintering waterfowl. Temperatures during the summer often ranged into the mid and upper 90's.

To make up for the wet summer we experienced an unusually dry fall. The first frost of the year occurred on September 17. No substantial rainfall occurred from mid-October through early December. Biological Technician Roy Rogers said he had not seen creek levels on the refuge so low in nearly 20 years. Some of the surrounding communities experienced difficulty with their water supplies as wells ran dry. We experienced no such problem on the refuge, but our winter green browse crop did suffer from the lack of rain. Seasonal amounts of rainfall returned in December, and we experienced our only frozen precipitation of the year on December 16 when a blanket of 5 inches of wet snow fell.



All the refuge staff and families enjoyed our one shortlived snowfall.

After the snow melted, unseasonably mild, wet weather set in and stayed through January and February. Daytime highs often reached the mid to upper 70's. Our co-operative farmers had to mow part of their winter rye to retard early development of the crop. By the first week in March, temperatures were ranging into the lower 90's. New record temperatures were set each day of the week. Peach trees, dogwoods, redbud, and other flowering plants decided it was spring and came into full bloom. The inevitable freeze came on March 12 and 13, but it was not severe enough to harm the flowering plants.

A period of high winds coupled with low humidity during the last two days of March and the first week of April dried out the sandhills and brought the fire hazard index to the critical point. Five wildfires occurred on the refuge during this time span. Rainfall covered most of the rest of April and alleviated the fire danger.

Periods of rain and drought seemed to alternate during the late spring and early summer. No significant rainfall was recorded on the refuge during the first two weeks of May. Once summertime temperatures begin to rise, two weeks without rain qualifies as a real dry spell in the sandhill region. Ample rainfall returned from mid-May through mid-June and provided for good growing conditions. However, an early summer dry spell started on June 17, and no more rain was recorded at our headquarters area for the remainder of the fiscal year. The most uncomfortable day of the year was June 22 when a high of 102° and a relative humidity of 98% were recorded. Refuge crops suffered greatly during this period. Weatherwise, the year ended very much differently than it had started.

B. Habitat Conditions

1. Water

Even during the October to December drought period, water levels in impoundments and streams were adequate for wildlife. Small clear streams are found throughout the sandhills, and numerous small springs bubble out of what appear to be pure sand dunes to provide a seeming paradox to all the sand. These streams and springs continue to flow freely even during the driest summers. First-time refuge visitors, not to mention new refuge employees, are generally quite surprised at the abundant surface water found in the sandhills.

Only one of the refuge's 30 impoundments, the Martins Lake Holdover Pond, is directly dependent on rainfall as its source of water. Other refuge pools are fed by springs and streams, and most of these areas have flashboard riser water control structures to regulate water flow and pool levels. Except for Martins Lake we were able to closely follow our water level maintenance schedule. For the second year in a row the water level in Martins Lake had to be lowered from approximately 60 acres to less than 5 acres so repairs could be completed on the lake's water control structure.

2. Food and Cover

The abundant rainfall during the summer of 1973 provided the moisture for a very good growing season for native wildlife food plants. The best food producers during the year included persimmon, summer grapes, pokeweeds, plums, blackberries, hickories, dogwoods, mushrooms, various varieties of lespedeza and most species of oaks. Both food and cover were adequate and carried resident wildlife populations through the winter of 1973-74 in good condition.

In addition to green browse and corn planted by co-operative farmers, refuge personnel planted 10 acres of Japanese millet in the Martins Holdover Pond and 2 acres along the edges of Mays Lake. Seed production was good on both areas. When the pools were reflooded during late October, they were heavily utilized by waterfowl.

II. Wildlife

A. Migratory Birds

The number of geese using the refuge increased substantially in both peak numbers and use days in FY 74 when compared to FY 73.



The refuge goose flock reached a record peak population of 2,000 birds during January, 1974.

After a period of declining goose use on the refuge, this year's increase in the overwintering flock was very encouraging. Goose use over most of South Carolina reportedly increased this year. Hopefully, this trend will continue and alleviate the short-stopping problem that has plagued this region of the Atlantic Flyway in recent years. Except for one lone snow goose, only Canada geese were observed on Carolina Sandhills this year.

A table delineating refuge goose use for the past five fiscal years follows:

	<u>Goose Use</u>				
	<u>FY '70</u>	<u>FY '71</u>	<u>FY '72</u>	<u>FY '73</u>	<u>FY '74</u>
Peak populations	1,300	1,150	575	700	2,000
Use Days	99,126	107,397	60,104	65,580	147,600

During the summer of 1973, twenty-six geese remained on the refuge to form our resident flock. Only one brood of geese containing two goslings was observed. Both of the goslings reached flight stage.

After the last non-resident geese migrated north in April, 1974, twenty-seven birds remained behind to form our resident flock until the end of the fiscal year. No nesting attempts were recorded during the spring of 1974.

Although there was a slight increase in peak duck populations during FY '74, there was a four percent decrease in use days recorded. Mallards, wood ducks, and black ducks were the prevalent wintering species. A table of refuge duck use for the past five years follows:

	<u>Duck Use</u>				
	<u>FY '70</u>	<u>FY '71</u>	<u>FY '72</u>	<u>FY '73</u>	<u>FY '74</u>
Peak populations	7,550	4,380	3,880	6,000	6,250
Use Days	846,113	665,496	444,165	721,140	691,890

Wood ducks are year-round residents and nest on the refuge. An estimated 670 wood ducks were raised to flight stage from both nesting boxes and natural cavities. A total of 80 wood duck nesting attempts were recorded in the 125 nesting boxes which were functional during FY '74. Approximately 62 percent of the boxes currently up are paper cylinders manufactured by Sonoco Paper Products of Hartsville, S. C. Wood ducks in this area show a preference for the paper boxes over both wooden and metal boxes. The paper boxes are easy to maintain and are very durable. The first paper boxes are now eight years old and are still in good condition.

Wading birds are seldom found in large concentrations on Carolina Sandhills. Most of the larger refuge ponds support small populations of great blue herons and green herons, while a few common egrets can be occasionally seen scattered over the refuge. Shorebirds recorded during

the year included killdeer, spotted sandpipers, solitary sandpipers and greater yellowlegs.

In the past the sandhills region of both North and South Carolina has been noted for its high mourning dove populations. Dr. George Haas, a research biologist with the Migratory Bird and Habitat Research Laboratory, Patuxent, Maryland, is conducting a long term research project on the mourning dove. The refuge is currently providing a major portion of the study area for the research project. Dr. Haas said that his field work during the fiscal year indicated that both reproduction and the total dove population were lower than last year.

B. Upland Game Birds

As in past years, bobwhite quail remained abundant on the area. In spite of heavy rain during the summer of 1973, quail reproduction was excellent. Throughout the winter several coveys of quail were regularly seen along the visitors' drive.



Bobwhite Quail

Past narratives indicate that the refuge once supported wild turkey populations of 75 or more birds. No turkeys or turkey signs have been seen by refuge personnel in over 3 years. Gobbling counts have been conducted on the refuge census route each March. The last turkey call heard on this route occurred during 1970.

We believe the wild turkey is gone in the sandhills of South Carolina. There are several plausible explanations for the disappearance of the turkey from the refuge. Good turkey habitat is limited to certain sections of the refuge due to soil types and resultant vegetation patterns. Free-ranging dogs are still a major problem and adversely affect several different wildlife species. Deer hunts are conducted on the refuge each fall. Checking back through past records we noted that as deer hunting pressure increased the turkey population exhibited a decline. Another limiting factor may be disease. Turkeys are raised commercially in this region. A farmer on the northern boundary of the region annually produces over 30,000 turkeys.

Until several of the current limiting factors are eliminated, we believe it will be impractical if not impossible to establish a viable turkey flock on Carolina Sandhills.

C. Big Game Animals

The refuge supports a white-tailed deer population of approximately 1,300 to 1,500 individuals. Track counts and night spotlight counts made along a permanently established 20-mile census route indicate that the refuge deer herd increased in FY 74 when compared to FY 73.

Deer reproduction was good. Does with twin fawns were spotted regularly along refuge roads and trails. All of the deer checked in during the refuge deer hunts appeared to be healthy, in excellent physical condition, and free of any ectoparasites.

A white fawn was found dead in the Ox Pen area during June of 1974. The fawn appeared to have been deformed at birth. Research personnel reported seeing an adult white deer in the Ox Pen area.

In order to obtain a more accurate base deer population estimate, we plan to increase the number of deer track routes used in our deer census during the upcoming fiscal year.

D. Fur Animals, Predators, Rodents, and Other Mammals

Through track counts and day-to-day observations significant changes were noted in only the gray squirrel, gray fox, and rabbit populations. A gray squirrel die-off occurred throughout this section of South Carolina, including the refuge. Gray foxes and cottontail rabbits displayed noticeable population increases. Other refuge mammal species remained generally stable and at or near past population levels.

Wild dogs, stray dogs and deer hounds turned loose on inholdings continue to plague our management programs and claim an inordinate amount of our time. Since other control methods have proven less than satisfactory, we hope to begin a live trapping program during the next fiscal year. The dogs are not only a nuisance and menace to wildlife but are also a potential reservoir for a rabies outbreak.

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

Raptors observed on the refuge during the year included kestrels and red-tailed, red-shouldered, marsh, sharp-shinned, ████████, Cooper's, and broad-winged hawks.

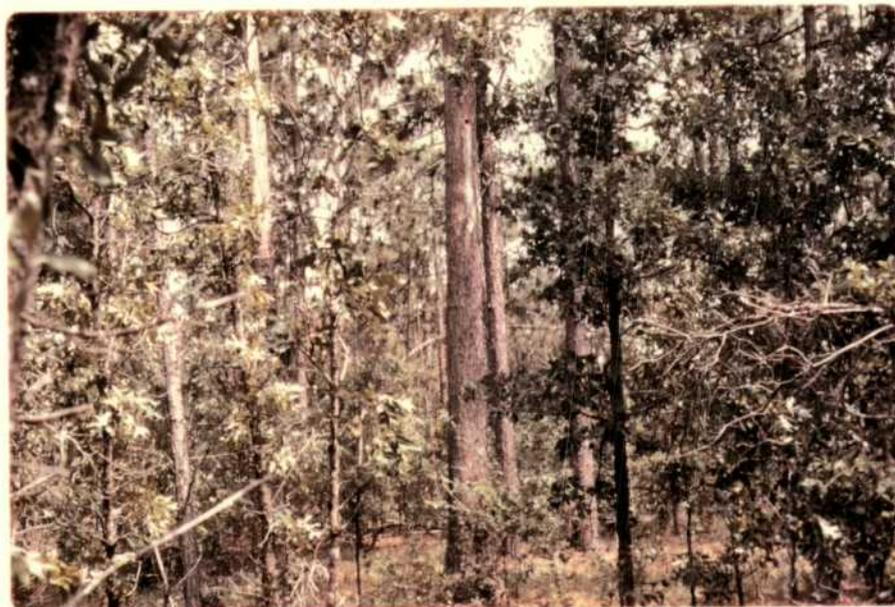
Screech owls, great horned owls, and barred owls were also either seen or heard during the year.

A golden eagle was observed near Martins Lake on December 26, 1973 and remained on the refuge through January, 1974.

Two ospreys were seen at Pool D on April 14, 1974.

F. Other Birds

Carolina Sandhills National Wildlife Refuge supports a large and active population of the endangered northern red-cockaded woodpecker. The red-cockaded woodpecker is the only bird found in the United States that makes a nest cavity in a living pine tree. The trees selected for the construction of nest cavities are usually old growth timber which contain a fungus disease known as red heart. Trees containing active nests are characterized by large areas of white, pitch coated bark around and below the entrance to the nesting cavity.



Red-cockaded woodpecker cavity in longleaf pine. Note pitch flowing from entrance hole.

The red-cockaded woodpecker is endangered because of a loss of nesting habitat. Intensive, short-rotation timber management currently being practiced throughout much of the southern United States often does not leave the mature, red-hearted pine trees needed by the red-cockaded woodpecker. Unless both private industry and governmental agencies make a concerted effort to manage for the red-cockaded woodpecker, the bird's status will become increasingly more precarious.



Red-cockaded woodpecker.

Each year, beginning in 1974, multiple use prescriptions will be prepared for two of the ten refuge management compartments. During the fiscal year, a reconnaissance cruise was completed in compartments 2 and 7. All active red-cockaded woodpecker nesting cavities observed during the reconnaissance were located on aerial photographs and compartment maps. Seventeen (17) colonies of red-cockaded woodpeckers were located in compartment 2 while ten (10) colonies were found in compartment 7.

During all future prescriptions, areas containing active red-cockaded colonies will be identified and delineated on compartment maps. Within the next four years we hope to obtain a much more accurate estimate of the refuge red-cockaded population. We also hope to come up with better information as to the birds habitat requirements and preferences as

well as long-range timber management practices that will perpetuate the red-cockaded woodpecker.

Management activities on the refuge are and will be directed toward protecting this bird and sustaining a habitat suitable for its continuing survival.

G. Fish

Fish populations in several refuge impoundments were supplemented by fish stocked from the Cheraw National Fish Hatchery. Fishing in refuge lakes ranged from fair to good during the year. At least two bass weighing over 12 pounds were caught in Martins Lake.



Largemouth bass caught at Martins Lake.

The following refuge impoundments were restocked during the year:

Lake Bee	-	200 Bass (6" - 8")
	-	750 Bass fingerlings
	-	3,750 Bluegill and redear sunfish
Martins Lake	-	1,950 Bass fingerlings
	-	9,750 Bluegill and redear sunfish
Lake 16	-	600 Bass (6" - 8")
	-	600 Bass fingerlings
Pool B	-	200 Bass fingerlings
	-	2,000 Channel catfish
Pool C	-	200 Bass Fingerlings
	-	2,000 Bluegill and redear sunfish

Balanced fish pond fertilizer was added to Pool J and Lake 16 during the growing season.

H. Reptiles

Numerous species of snakes and turtles were observed during the year. Refuge impoundments contain high populations of turtles. Cottonmouths and other water snakes are commonly encountered around the impoundments.

During the fiscal year, one unusual amphibian, tentatively identified as the pine barrens tree frog (Hyla andersoni), was found and photographed by Assistant Manager Shell.



Pine barrens tree frog.

To our knowledge this is the first record of this amphibian in South Carolina. The literature lists the frog's distribution as limited to the pine barrens area of New Jersey and five counties in North Carolina. The 1973 edition of the "Red Book" (Threatened Wildlife of the United States) lists the pine barrens tree frog as a threatened species.

I. Disease

Dr. George Haas, while working on his mourning dove research project, again found that the refuge dove population was infected with trichomoniasis. This disease has been found in doves on the refuge every year since 1969.

Dr. Paul L. Barrows, Dr. J. S. Smith, and Gary L. Doster of the Southeastern Cooperative Disease Study Group, working out of Athens, Georgia, collected 12 mourning doves from the refuge on June 12. These birds will be examined as part of their disease study.

III. Refuge Development and Maintenance

A. Physical Development

Due to our limited operating budget in fiscal year 1974, most major development and maintenance work had to be deferred. As is the case with most refuges, our backlog of development and maintenance activities continues to mushroom with no sign of relief.

With the assistance of the Sand Hills State Forest we were able to show some progress in our interpretive program during the year. An observation tower was erected at the northern end of the refuge auto drive overlooking the Ox Pen management unit. In addition to the tower, a shelter was constructed at Lower Triple Lake in conjunction with a planned environmental study area.

Two much needed pieces of equipment, purchased in previous fiscal years, arrived during fiscal year 1974. We received a new 2030 John Deere tractor to replace our only real farm tractor which had logged several thousand hours over a twenty year period. A new 5-ton dump truck arrived in April and was also put to immediate good use.

Just before the gasoline crunch, we installed a new 2,000 gallon storage tank and pump at refuge headquarters.

Heavy summer rains eroded many refuge roads and trails and necessitated substantial repair work.



Typical refuge sand-based road.

Other developments and day-to-day maintenance activities were detailed in our monthly activities reports and will not be relisted in this annual narrative.

B. Plantings

1. Aquatics and Marsh Plants None
2. Trees and Shrubs

Approximately 17,600 longleaf pine (Pinus palustris) seedlings were planted on 22 acres in Compartment 10 of the refuge during fiscal year 1974. The seedlings were planted at the rate of 800 seedlings per acre, and seedling survival was satisfactory. The area planted was an understocked pine-scrub oak stand.

Approximately 1,000 multiflora rose plants were planted near the refuge headquarters complex and near refuge gates.

In addition to the multiflora rose plants, twenty-five dogwood, ten crab apple, and a number of holly trees were planted in the refuge headquarters area.

Approximately one thousand eastern red cedar were planted along the

refuge visitors' drive and within the headquarters area. All plantings in the headquarters area were done in an attempt to improve the aesthetic qualities of the area and to provide habitat for the many species of small birds and animals that use the headquarters area.

3. Upland Herbaceous Plants None

4. Cultivated Crops

Most refuge farming is accomplished by co-operative farmers. During the year our co-operative farmers cultivated a total of 1,182 acres including the following crops: 158 acres of corn; 475 acres of rye; 330 acres of soybeans; 209 acres of browse (wheat); and 10 acres of small grain (wheat) for seed.

Crop yields were variable due to erratic weather conditions. A late frost that nipped rye fields that had just begun heading out resulted in reduced yields on the farmers' rye crops. Winter browse suffered during the October to December drought but still produced enough food for wintering waterfowl. When harvested the co-operators' soybeans averaged 12 to 13 bushels per acre.



Despite periods of dry weather which reduced yields, ample hot food was available for both migrating and resident wildlife.

In addition to administering the co-operative farming program, refuge personnel planted 10 acres of Japanese millet in the Martins Lake area and 2 acres of millet near Mays Lake. Several new bicolor lespedeza food strips were planted, and food strips located throughout the refuge were refertilized.

Farm fields in compartment 2 and compartment 7 were terraced with the refuge motor grader in an erosion control project.

C. Collections and Receipts

1. Seeds and Other Propagules

In addition to the refuge's share of crops left in the fields for wildlife, co-operative farmers harvested 100 bushels of wheat and 100 bushels of rye for refuge use. The wheat was used primarily by research personnel in their mourning dove banding project, while the rye was given to the Sand Hills State Forest to plant food plots on the forest.

2. Specimens None

D. Control of Vegetation

Brush in food plots, on dikes, and in some refuge trails was sprayed with Silvex. The results of the control program were successful.

Water milfoil growing in two refuge pools managed primarily for fishing, Lake Bee and Lower Triple Lake, was also treated with Silvex.

Wild mustard growing on the Martins and Ox Pen farming units was disked twice during the summer, prior to the planting of winter browse.

E. Planned Burning

No controlled burning of commercial timber stands was done on the refuge during FY 1974. Planned burning operations were limited to 154 acres in the Ox Pen farm unit.

F. Fires

Six wildfires occurred on the refuge in 1974. The first fire occurred on April 1, 1974, adjacent to State Highway 151. The fire burned approximately 138 acres on refuge land and 10 acres on adjoining private land. The fire was started by a lighted cigarette which was thrown out by a passing motorist. A salvage sale was conducted in this area several months after the fire. Several trees were infested with the southern pine beetle following the fire.

Fires 2,3,4, and 5 were all set by unknown sources during the night or early morning of April 4, 1974. Three fires totaling approximately 15 acres were set along State Highway 145. The other fire occurred along a county road five miles from the other fires. This fire burned approximately 23 acres. No damages occurred from these four fires.

Fire 6 occurred on April 29, 1974 in Compartment 7 adjacent to a railroad track. The fire was started by a train passing through the refuge. The total burned acreage was 15 acres. Several other fires were set by the same train that day on the adjacent state forest. No damages resulted from this fire.

Under co-operative agreement, the South Carolina State Commission of Forestry has the responsibility for fire suppression on the refuge.

IV. Resource Management

A. Grazing

All grazing on Carolina Sandhills Refuge has been terminated.

B. Haying None

C. Fur Harvest None

D. Timber Removal

To understand the timber management program at Carolina Sandhills, one must first be familiar with the history of the refuge.

Prior to the establishment of the refuge, project land was acquired from 1936 to 1939 by purchases and other civil actions under the authority of the National Industrial Recovery Act and the Emergency Appropriation Act of 1935. Land acquired under this project was known as the Sandhills Project (LA-SC-4).

A co-operative agreement (A-SC-454) between the old Bureau of Biological Survey and the South Carolina State Commission of Forestry was signed on April 29, 1939. Conditions of this agreement divided the Sandhills Project into two areas. One-half of the area was named the Sand Hills State Forest, while the other half of the area was named Carolina Sandhills Wildlife Refuge. By Presidential Proclamation No. 2416, the name of the refuge was changed to Carolina Sandhills National Wildlife Refuge in July of 1940. Title to the entire project is retained by the United States Department of the Interior.

The state forest was established as a demonstration conservation area embodying the principles and objectives of planned multiple land use. The agreement listed certain forestry, wildlife, and recreational

management practices that were to be followed by the Forestry Commission in reaching the above objectives. The refuge was established as a Federal refuge and breeding ground for indigenous wildlife and a game management demonstration project from which scientific and practical data could be secured for the extension of wise game management and forest practices to other lands of South Carolina and surrounding states. This agreement was for 50 years and provisions were made for automatic renewal of the agreement for three successive terms of 15 years unless written notice to the contrary is given by either side.

In addition to the general management of the state forest, the Forestry Commission has the responsibility of planting and harvesting timber products on the refuge with the stipulation that planting and harvesting operations conform to good wildlife and forestry management practices. In return the U. S. Fish and Wildlife Service has the responsibility to supply technical services for the wildlife planning and research of the state forest as well as the refuge.

All income which the state receives from the Sandhills Project must be spent, with the approval of the Service, on developing and maintaining the Project.



Forester Robinson inspecting timber sale.

In fiscal year 1974, personnel of the Sand Hills State Forest marked and sold 609,240 board feet (Scribner) of pine sawtimber, 27,679 board feet (Scribner) of hardwood sawtimber, 619 cords of pine pulpwood and 151 cords of hardwood pulpwood on 247 acres of Carolina Sandhills Refuge. This timber was sold in three sales by sealed bid. Total income from these timber sales was \$70,936.26.

Timber sales on the refuge during the year included both small clear-cut areas that were site prepared and replanted and release cuts that removed the overstory and released natural regeneration.



Clearcut area in Compartment 7.

All future and present clearcuts on the refuge will be 50 acres or less and will be laid out with the contour of the land to provide the optimum wildlife habitat.



Watermelons in cut over area of Compartment 7.

Following timber removal, clearcut areas are site prepared and leased for watermelons the summer following the cutting. The watermelon farming adds needed fertilizer to the soil in preparation for the planting of longleaf pine seedlings the next winter.

In addition to the timber sales, the resinous stumps on 68 acres of the refuge were sold to Hercules, Inc. for a total sum of \$352.17. The sale of resinous stumps was limited to those areas that had been clear-cut and scheduled for clearing and planting. Several tons of stumps were also removed from the site of the proposed Hollands Lake impoundment.



Pine straw is commercially baled from both the refuge and the state forest.

During the year scattered incidences of the black turpentine beetle (Dendroctonus terebrana) were evident throughout the refuge. The majority of these beetle infested trees had been struck by lightning. Beetle infested trees are usually marked and sold as salvage timber. Salvage sales are conducted throughout the year on the refuge and state forest.

During the annual meeting in May between the Service and the S. C. Forestry Commission, a decision was made to utilize annual compartment prescriptions for determining the multiple use needs of the refuge and state forest in lieu of the previous arbitrary decision to exclude 27 percent of the forest from normal management considerations. A compartment schedule was made and listed in the revised management plan. All future harvest activities, except salvage, will be based on joint annual prescriptions and restricted to two compartments per year on the refuge and two compartments on the state forest. These joint prescriptions should greatly improve communications between the Service and the S. C. Forestry Commission.

V. Field Investigation or Applied Research

A. Progress Report

The Carolina Sandhills Mourning Dove Project continued during FY 1974. A progress report by the project's research biologist, Dr. George Haas, follows:

Research activities at the Carolina Sandhills Field Station included (1) a mourning dove calling behavior study, (2) a mourning dove habitat use study, (3) an evaluation of color markers on mourning doves, (4) a mourning dove crippling loss study, and (5) a radio-telemetry study of mourning dove movements and habitat use. A report on aging immature doves by primary feather molt was prepared, and the conclusions of this study are as follows:

Wild mourning doves in North Carolina and South Carolina shed their first primary at 38 days of age, their second primary at 43 days of age, their third primary at 52 days of age, their fourth primary at 60 days of age, their fifth primary at 70 days of age, their sixth primary at 80 days of age, their seventh primary at 93 days of age, their eighth primary at 112 days of age, their ninth primary at 122 days of age, and their tenth primary at 131 days of age. These age estimates were similar to age estimates of wild mourning doves in Indiana.

No difference was found in the age at which mourning doves replaced specific primaries (primaries one through ten) from 1968 through 1974. During this time period, a crop failure and differing weather conditions had occurred, but they had no effect on primary molt.

No difference could be found in the ages at which immature male and immature female doves replaced the same primaries.

These five studies will be continued in 1975.



Wing markers were placed on refuge mourning doves as part of habitat study.



Several doves were also fitted with radio transmitters and tracked as part of the same study.

VI. Public Relations

A. Recreational Use

During fiscal year 1974 a total of 59,111 visits and 145,791 activity hours of public use were recorded on Carolina Sandhills National Wildlife Refuge.

Hunting and fishing combined accounted for 42 percent of all recorded activity hours; while non-consumptive wildlife/wildlands recreation, primarily wildlife observation, followed with 31 percent of the total activity hours. More actual visits were recorded for the wildlife/wildlands activities. The observation area at Martins Lake was used heavily by area visitors observing resident and wintering waterfowl. Most of the remaining wildlife observation activity hours were accounted for by visitors driving the auto route looking for deer and other wildlife. Many area residents make regular weekend trips to the refuge trying to see a deer.

Interpretation activities ranked next in occurrence with 13 percent of the total activity hours. Most interpretive visits were recorded in conjunction with the self-guided auto drive.

Non-wildlife oriented recreation also shows up on fiscal year 1974 reports with 13 percent of the total activity hours. However, this figure is misleading as under our old system of reporting, all camping activities were reported in the non-wildlife categories. Much of the 13 percent use was composed of camping by scout groups and refuge hunters which related to wildlife oriented activities.

Environmental education accounted for less than one percent of the total activity hours. There is the potential for some quality environmental education work in this area, but the refuge currently lacks the staff and money to properly develop the programs.



Sunset from refuge auto drive. The sandhills have their own unique form of beauty.

B. Refuge Visitors

A log of official visitors is kept in the refuge office.

C. Refuge Participations

In addition to two off-refuge programs, refuge personnel presented various types of on-refuge programs to four scout troops, six school groups, and one church group.

The Palmetto Retriever Club held its annual field trial on the refuge, and we again played host to the South Carolina Conservation Camp for one day.

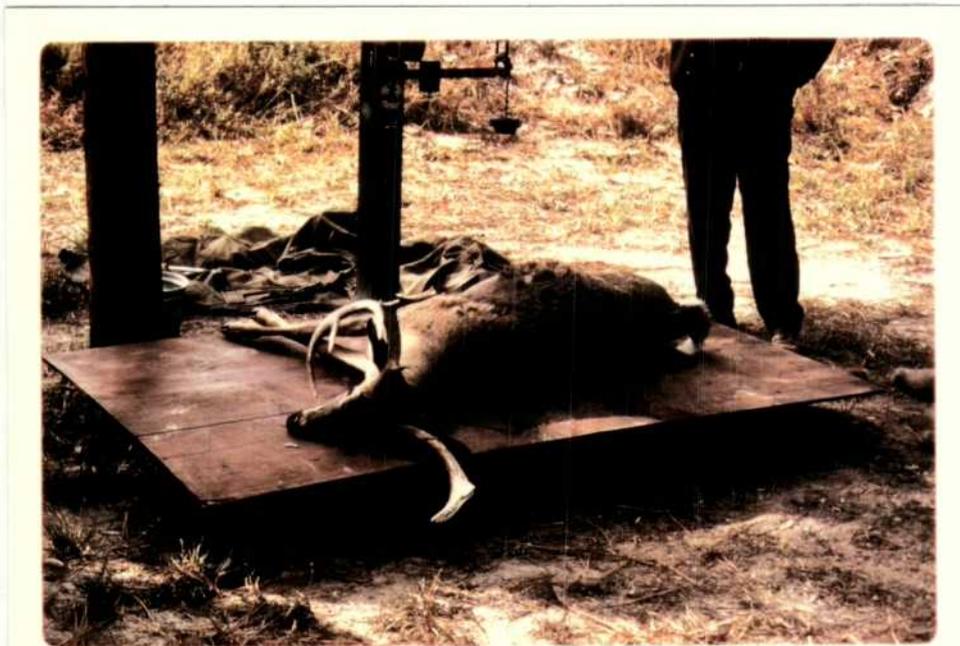
Several radio spot announcements and local newspaper articles concerning refuge programs were released during the year.

Ted Borg, Chief Photographer of the S. C. Wildlife and Marine Resources Department, spent several days on the refuge gathering information for a feature article on the sandhills region. The article was to be published in fiscal year 1975.

D. Hunting

In conjunction with the Mourning Dove Research Project, a refuge dove hunt was conducted at the Ox Pen farm unit on September 8 and the four succeeding Saturdays. Hunter success was poor throughout the hunt, and hunting pressure was light. Only two persons showed up for the last day of the hunt.

Two deer hunts were conducted on the refuge in fiscal year 1974. Six deer were harvested during an either-sex archery hunt that ran from October 15 to October 20. Hunter participation in the archery hunt was up from 290 man-days in 1972 to 420 man-days in 1973. We considered the hunt a success as we experienced little problems with the archers and most of the hunt participants expressed satisfaction with the hunt.



All deer checked in during refuge hunts appeared to be in excellent condition.

Both hunting pressure and the total harvest were down during this year's gun hunt when compared to the 1972 gun hunt. A total of 3,114 hunter days were recorded for 9 days of gun hunting. Sixty-six legal bucks were checked in during this year's gun hunt compared to 96 bucks harvested during the 1972 gun hunt. The reduction in harvest can probably be attributed to the weather. Windy, very dry days prevailed throughout the hunt.

E. Violations

White-tailed deer were eliminated in this part of South Carolina during the last half of the nineteenth century and remained absent until the Service began restocking the refuge in 1943. As the deer herd grew through the years, our law enforcement problem increased. The refuge is now surrounded by private hunting clubs and even contains several private inholdings that are leased for deer hunting. To further compound the problem the county (Chesterfield) in which the refuge is located has a 3½ month legal deer season and permits deer hunting with dogs. After the first few days of the open state season, the refuge deer herd begins to sorely tempt some of the surrounding hunt clubs. For the next 3 months the refuge staff is kept busy trying to keep deer hunters and all the deer hounds in the world under control. Two weeks or a month of a wild deer season we could understand and live with, but a 3½ month season gets to be a bit hectic.

During fiscal year 1974, fifty-two violations were detected and prosecuted. A list of the violations and their dispositions follows:

Cases Prosecuted in State Court

<u>Violations</u>	<u>No. Prosecuted</u>	<u>Disposition</u>
Fishing after dark/Unauthorized fire/ no license	7	Fined \$15.00
Violation of refuge hunt regulations	29	Fined \$15.00
Hunting on refuge	5	Fined \$25.00
Loaded firearm in vehicle	6	Fined \$15.00
Firearm on refuge	2	Fined \$10.00
No hunting license	1	Fined \$50.00

One case involving a loaded firearm on the refuge was tried in Federal Magistrate's Court. The magistrate fined the individual involved \$100.00, administered a strong lecture on hunting and dog trespass, and suspended the execution of the fine under the stipulation that the hunter involved and/or his dogs would never again trespass on the refuge and that the hunter would deliver the judge's admonishment to all the other hunters he knew. We plan to carry more cases to Federal Court this year.

One major violation occurred during the year. On September 29, 1973, Assistant Manager Shell was walking down a refuge trail near Ham Creek when a trespassing hunter stepped into the trail at a distance of approximately 50 yards. When Mr. Shell spoke to the hunter, the individual started raising his shotgun and pointed it at Mr. Shell. As Ronnie dived behind a stump the hunter shot and then wheeled and ran off through the thick titi swamp. After a thorough investigation by the FBI, Mr. Dwight Eugene Mungo of Lancaster, S. C. was charged with assault with a

deadly weapon on a Federal officer. The case was tried in U. S. District Court in Florence, S. C. during January of 1975. The jury found Mungo guilty and the judge sentenced him to serve concurrent six-month terms in prison on assault and trespass charges and then to serve a three year probation period on the assault charges.

This case, the subsequent FBI investigation, and an intensified refuge enforcement effort all combined to help ease our deer hunting-trespass problem and convince some of the hunt clubs, who have some members who do not quite fit the title "sportsmen" that they might not want to be so blatant in their hunting activities around the refuge.

F. Safety

Refuge personnel had no accidents during the fiscal year. Monthly safety meetings are conducted utilizing safety films, slide series, and various types of safety literature. The refuge staff is reminded to be alert for any possible safety hazards and to see that they are immediately corrected.

One accident occurred among the using public during the year. Two local hunters were shot and wounded during the refuge deer hunt. The hunter who did the shooting stated that he saw a big buck run off into the brush, then saw movement and thinking it was the deer he fired 5 times with 12 ga. buckshot. One of the victims suffered wounds in the left hip and left shoulder with one pellet lodged near the spine while the other victim had a scratch on his right wrist and a pellet in the lower abdomen. Both men recovered satisfactorily. This accident brought about several needed changes in refuge hunt regulations. The use of man drives and buckshot was eliminated, and the regulation requiring each hunter to wear fluorescent orange material was strictly enforced. The hunters who were shot were not wearing their safety vests at the time of the incident.

VII. Other Items

A. Items of Interest

Fiscal year 1974 was one of changing personnel at Carolina Sandhills. James Howe, Refuge Forester transferred to El Dorado, Arkansas in October to oversee timber harvest operations on the proposed Felsenthal and D'Arbonne Refuges. James, who was the Daniel Boone of local quail hunters, contributed much to the total refuge program during his four year tour at Carolina Sandhills Refuge.

David Robinson transferred from Noxubee National Wildlife Refuge in February, 1974 to replace James as Refuge Forester. Dave is kept busy coordinating forest management with the S. C. Forestry Commission under the 1939 co-operative agreement.

After 8½ years of managing Carolina Sandhills, George Garris transferred to Cape Romain as manager during August, 1974 (FY 75). Under George the refuge made a lot of progress during some very austere times. We all wish George and his family continued happiness at their new station and hope they will come back to the "Sandhills" and visit from time to time.

Marvin Hurdle arrived on board from Lake Woodruff National Wildlife Refuge in August, 1974 to take over as Refuge Manager. Marvin was welcomed by the opening day of the S. C. deer season and all the associated problems. We know all those deer hounds running loose on the refuge must have been a shock to his system. At this writing Marvin has recovered from the deer hunts and has his hands full just keeping the rest of us in line.

This narrative was compiled and written by Assistant Manager Ronnie Shell and Forester Dave Robinson and typed by Clerk Kay Warr who deserves a valor award for deciphering the handwriting and spelling of the two authors.

Report Submitted By:

Marvin T. Hurdle
Marvin T. Hurdle
Refuge Manager

Date:

3-14-75

Approved

(Name)

Assistant Regional Refuge Supervisor

MAR 17 1975