

# THE FRANCIS MARION TURKEY PROJECT

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The Francis Marion National Forest Wildlife Preserve lies partly in both Charleston and Berkeley Counties, in what is widely known as the low country of South Carolina. The Northeastern boundary is on the South branch of the Santee River. From here it stretches to the southwest for more than seventeen miles to include almost the entire drainage of Wambaw Creek.

The timber consists of longleaf and loblolly pines, with scattered stands of upland hardwoods. These are interfused by many branches and creeks which produce gum and cypress swamps with borders of bottomland oaks.

The preserve as set up by presidential proclamation on May 10, 1948, under authority of Public Law 257 of the 80th Congress, occupies 50,000 acres of excellent wildlife land. On June 18, 1948, an agreement was drawn up between the United States Forest Service and the South Carolina Wildlife Resources Department to incorporate this land with an additional 10,000 acres in two smaller tracts into a Cooperative Wildlife Management Area. This agreement led to the establishing of two Federal Aid Projects to carry out development and live trapping.

The cooperative wildlife area has been divided into a refuge of 17,000 acres and a public hunting area of 43,000 acres in order to facilitate management.

The refuge, which is known locally as the Waterhorn Tract, was selected to serve as a sanctuary because it had a fair resident population of the native wild turkey, contained a variety of excellent habitat, was free of private holdings, had no public roads within its boundaries, and was partially surrounded by a hog-proof fence. Here intensive management has been carried out to build the largest possible population of turkeys in order that they may overflow onto adjacent lands, both public and private, to provide better hunting; furnish a surplus to be used in restocking other areas of the state in which suitable food, cover, and protection are available; furnish breeding stock for the adjacent managed hunt area; and insure the perpetuation of the native pure strain of eastern wild turkey existing there.

Development work was started in the summer of 1948 and should be completed by the end of the project year in 1954. Management has included prescribed burning, clearing, planting, control of domestic stock, control of other species, protection, adapting forest management practices, and live trapping for restocking.

Development of the public hunting area has been limited to posting the boundary, erecting road blocks, and prescribed burning by the Forest Service in their timber management. Plans governing development and public hunting are being drawn up at the present time. The objectives of this program will be to provide good turkey, deer, and small game hunting with a minimum of regulation.

The management practices in use on the refuge will serve as a basis for extensive development which will be undertaken in the remainder of the preserve.

## PRESCRIBED BURNING

The wild turkey has long been recognized to prefer open stands of timber. To obtain this condition on the Francis Marion National Forest it is necessary to remove regularly by prescribed burning the accumulation of brush, pine straw, and matted grasses that occur in pine stands. Thinning the woody understories releases the more desirable herbaceous vegetation. In addition, areas burned with winter fire furnish good grazing in early spring. In localities such as ours where burning the woods is a time-honored custom, it also provides protection from wild fire by reducing the amount of fuel present.

Both summer and winter burns can be used in pine stands with good results. Prescribed burning in the summer should only be attempted in large timber with extremely dense, heavy stemmed undergrowth. It should not be used where the understory contains a large number of dogwoods or other desirable species, because the kill-back is severe. It also requires exacting conditions, since timber is easily killed by fire at this time. Summer burning should not be attempted before August, when the nesting of wild turkeys has been completed. The loss of a large part of the fruit and mast ordinarily produced on areas treated in this manner persists for at least two years.

Winter burning can be applied over larger areas under more liberal conditions. The season lasts from the first of December, when vegetation becomes dormant, until the end of February, when wild turkeys begin their breeding season. Our program provides for burning about one-third of the refuge each year. Last year 4,300 acres were burned in the winter season, and 250 acres were burned during the summer. The cost of the winter burn was approximately 15¢ per acre. Care has been exercised to keep fire out of mature, upland hardwood stands when possible, in order to protect the winter food supply.

Prescribed fire has also been an excellent tool in maintaining grass fields. The invasion of woody growth can be set back whenever there is need of doing so. If fields are burned by a slow fire during January or February, a large quantity of grass and weed seeds are made available.

## CLEARING

Clearings afford feeding, dusting, nesting, loafing, and breeding grounds. These openings supply foods taken in the warm months by producing grasses, insects, and succulent fruits. Nests are usually located near openings where brooding hens have an abundant food supply and dusting sites at hand.

Proper interspersion of clearings provides for maximum use of the range by increasing the carrying capacity and encouraging use of the less desirable areas.

Clearings have been created as fields and right-of-ways. Fields are more adaptable and can be selected to fulfill predetermined needs. They also reduce border competition which is noticeable in strip clearings. The right-of-way strip clearings will be used to produce permanent pasture and native grasses. They will also provide permanent fire breaks and well drained road beds that are exposed to direct sunlight.

In the selection of sites for clearing, several points were considered. The soil should be suitable for the desired crops, and, of course, both the quantity and quality of foods produced will be determined by the soil fertility. In addition, use

was made of old fields and poorly stocked stands of timber wherever this was possible. Other considerations included fitting the pattern of distribution and avoiding sites that would encourage poaching.

The refuge has been divided into fifteen planting units. Four per cent of each of these units will be cleared for a total of about 675 acres. The creating of openings will then be complete, unless use indicates a larger acreage is necessary.

The clearing procedure is to locate the sites and cruise the timber and pulp with Forest Service personnel, who then make the sale. After the timber and pulp are removed the land is cleared with a D-7 bulldozer. The size of the fields vary from one to twelve acres. Fields smaller than one acre tend to complicate planning and administration.

## PLANTING

Approximately 250 acres have been cleared in 107 fields and two right-of-ways to provide openings. These openings have been planted in various crops that supplement the native food supply. The practice is particularly beneficial in improving the quality of range in large areas of pine woodland. In instances of low populations, such as recently restocked areas, the range of the flocks could probably be controlled rather successfully by planting. This practice can hold birds where adequate protection is provided.

The crops used furnish an abundant, well distributed, year around food supply in conjunction with the native foods. They are adapted to a minimum of cultivation and tend to cut down annual operations. Crops are favored that can be maintained with least expense, and that are capable of withstanding pressure from a large deer herd.

New clearings have been planted to annuals for the first few years in order that the soil could be conditioned and the sprout growth reduced by cultivation. Then reseeding annuals, perennials, and native grasses were established.

Food plantings receiving the heaviest use in late fall and winter have been chufas and pastures of oats and fescue and ladino. In the warmer seasons chufas, millets, and native grasses receive the most use.

Chufas are probably the single most important crop we have planted. The birds avidly seek the tubers of this sedge from the time the first spring plantings mature in August until they start sprouting the following spring. In old plantings which were not disked to encourage a crop the following year, birds have been observed using them even in early summer. Often plantings of this crop must be protected from turkeys if they are to become established. It is important that plantings also receive protection from raccoons, squirrels, and crows. Raccoons are particularly vulnerable to live trapping at this time. Deer have been observed to feed on the tubers during the fall and winter. This use is increasing and may become a problem in the future.

Chufas are adapted for use in sandy soils. Yields have been estimated to be from 50 to 75 bushels per acre. Seed is sown by broadcasting 25 to 35 pounds per acre and can be planted with good results from the first of April to mid-August. No cultivation has been necessary. Our plantings have been fertilized with 300 pounds of 3-12-12 fertilizer and 50 - 100 pounds of Nitrate of Soda per acre. Old plantings, some of which are in their third or fourth year, are now being retarded

by native grasses. The use of some pre-emergent weed killer might well be justified when it is desired to establish this sedge in old fields.

At the present time there are about thirty-five acres of chufas plantings on the refuge.

Oats have been planted to provide winter pasturage on newly created fields. The green forage is eagerly sought by both deer and turkeys throughout the winter months. This use continues until native vegetation begins to turn green in early spring. Plantings of oats are then forsaken until the crop matures, when both deer and turkeys again return to feed on the ripened grain. Approximately seventeen acres of this crop were planted last year, and twenty acres will be sown this year.

Fescue and ladino pasture has met with excellent results after a rather slow start. This combination appears to be the best way to provide green winter forage by permanent pasture. The acreage in this type of pasture will be greatly expanded during the current season.

German, brown-top, and proso millets have been planted to provide abundant seed crops during the summer. Excellent stands of both German and brown-top have been obtained by disking last year's stand and applying 100 to 300 pounds of 3-12-12 fertilizer per acre. In maintaining stands in this manner no other seed has been necessary after the first year. Millet stands to be perpetuated were disked in early spring. They are adaptable to both sand and clay soils.

Native grasses readily taken over three or four year old openings if they have been cultivated several times. In well drained soils crab grass and a variety of paspalums predominate, and in low sites tickle grass and bull grass are dominant. These crops are maintained by burning and disking. Liming and fertilizing have appeared to improve the palatability of the grasses.

Other crops that have been of value are corn, rice, bahia and bermuda grasses, and serecia lespedeza. Both corn and rice were planted in order that they could be used as bait for deer and turkeys by the trapping project. The seeds of bahia are stripped by turkeys, and both it and bermuda produce good crops of insects. Serecia has been of value chiefly to improve the forage qualities of the native grasses.

New crops that are being planted for the first time this fall are dallas grass and white dutch clover and rye grass and reseeding crimson clover.

Both bicolor lespedeza and multiflora rose have been established. They have been severely set back by browsing from deer. Repellent was used in an attempt to alleviate this condition, but was unsuccessful. Only one bicolor strip has done satisfactorily, and turkeys have shown no inclination to use the seed.

## CONTROL OF DOMESTIC STOCK

In order that plantings could be established and maintained efficiently, both hogs and cattle that were permitted to range within the 23 mile stock-proof fence had to be removed. The exclusion of domestic stock also served several other functions. Probably the most important of these was to reduce competition for the available foods, primarily mast. It eliminated the trampling and grazing of stock during the nesting season, and circumvented human disturbance by removing the incentive to use the area by livestock owners. Large populations of wild or semi-wild hogs are potentially capable of widespread destruction to both nests and

young of ground nesting birds. Also, the production of such valuable field crops as chufas is almost impossible when these animals are present.

At the time development work was initiated there were approximately 500 hogs and 150 cattle on the tract. Permits to range cattle terminated March 31, 1949, and were not renewed. A three month period was given all owners with a valid claim on hogs to hunt and remove their stock. They were assisted in this work by project personnel. At the end of the three month period, a trapping and hunting program was started in which all marked hogs taken were returned to their owners. This policy continued until it became evident that some owners were promptly releasing these same animals within the refuge boundary again. The procedure now is to sell the hogs or trade them for labor and services.

The trapping has been done with a ten by ten (10 × 10) foot pole or board trap with a drop door. The hunting was done with horses and catch dogs, or by shooting the animals as they feed at food patches.

All the cattle have been removed, and only two or three dozen hogs remain in the 17,000 acres.

## PROTECTION

In order to obtain full benefit from these management practices, protection had to become a vital part of the program. Both Charleston and Berkeley Counties have produced excellent hunting until recent years. This has encouraged disregard for necessary hunting restrictions. The ever-increasing hunting pressure and shrinking of lands open to the general public for shooting is now enforcing closer observance of game laws.

The wild turkey, when hunted legally, is well able to take care of itself. However, the birds are vulnerable to poaching under certain conditions. When they are in one or two brood sized droves during the late summer and poults are "frying-size," unethical hunters can easily kill them down to the last birds. Older birds are particularly susceptible to baiting and to road hunting in wet weather. Indeed it would seem that the local game laws on both deer and turkeys are liberal enough for even the most fervid hunters. They provide a ninety-six day season in which five gobblers can be taken, and a 140 day season in which five bucks can be taken.

Since our program operates on public lands administered by the United States Forest Service, the principles of multiple purpose and wise use are followed. This foregoes the possibility of restricting entry into the refuge other than not permitting motor travel on the roads. Several road blocks have also been erected on the public hunting area on the less important roads.

The boundaries of both the refuge and the preserve have been marked with signs and parallel bands of yellow paint on the larger trees. The maintenance work on this phase is done by the two full-time wardens and the part-time warden and labor-patrolman assigned to the project.

Violations on the refuge are few enough to be of small consequence. However, the remainder of the preserve with its well distributed roads and fifty mile perimeter cannot be adequately protected by our wardens without good local support both in the field and in the courtroom. Probably our most important need at the present time is to build public support and good will.

## ADAPTING FOREST MANAGEMENT PRACTICES

In order that timber and game management practices are in accordance with each other, it has been necessary to adapt technique of both. Over 650 acres of potential timber producing land controlled by the United States Forest Service will soon be cleared to provide openings to improve wildlife habitat in the refuge. In order to avoid human disturbances, some roads have been closed to motor travel, and permits for grazing and cutting the fire wood and posts are no longer issued for this area. In addition, new right-of-ways have been cleared in a manner that will provide for their use to produce strips of permanent pasture and native grasses. The period for summer burns has also been adapted to fit the needs of wildlife. Timber stand improvement practices which are very detrimental to turkey range will be restricted to less valuable cover, and large timber and pulp operations will be started in the late summer to prevent disturbance during the breeding season when possible.

## LIVE TRAPPING AND RESTOCKING

The present turkey population of the refuge is well past the critical stage of "insuring the perpetuation of the native pure strain," which was one of the basic reasons for establishing this preserve. In fact, a good population as early as the fall of 1949 indicated that "some live trapping could be done in the near future if the birds continued to increase at the present rate." Work was initiated on the trapping project November 1, 1950. The objectives have been to establish turkeys, deer, and other game animals in sections of the state where adequate food, cover, and protection are available; and to control populations that afford competition for the food supply or serve as predators on the preserve.

Restocking has been done where the species released were absent or present in low or faltering numbers. Most of the stock has been taken from the Francis Marion Turkey Refuge, but some live trapping has also been done in other places where need indicated. The first areas to be restocked are the Sumter National Forest, the Clemson College Game Management Area, and other parts of the Francis Marion National Forest, and a state sanctuary. When this is completed, restocking of suitable private lands is anticipated.

The first attempt to live trap turkeys was made in February, 1951. Since that time, thirty-five birds have been released for restocking. The effectiveness of live trapping for wild turkeys has been closely related to the abundance of native and cultivated foods. Disturbances and competition by doves, squirrels, and deer for bait are also important factors.

Two types of traps, wire pen-trap and a cannon projected net trap, have been used in this work. The wire trap was modeled after that of the Georgia Game and Fish Commission. It is a pen with sides and top of 5/8", 14 gauge, rabbit and poultry wire. These pens measure about twenty by thirty feet and have doors in opposite ends that drop simultaneously. The doors are held in place by drop poles when the trap is thrown by the operator. Birds taken by this trap sometimes skin their heads badly. Twenty-seven turkeys have been trapped in this manner, and one large gobbler has been the only fatality prior to release.

A cannon projected net trap was borrowed from the Cape Romain Migratory Bird Refuge. It was used by the Fish and Wildlife Services for trapping both

waterfowl and turkeys. It is easily superior to the pen trap for making quick catches, but birds taken in this net lost many feathers from their backs. This damage to the birds may have been avoided if they had been handled more rapidly after capture. The mesh and twine sizes of the net were also thought to be factors in the loss of feathers. Five birds were taken with this trap.

A new cannon projected net trap embodying several changes has recently been prepared for use on the trapping project by Adams Net and Twine Co. of St. Louis. Four birds have been captured with the new net. They lost very few feathers and were in excellent condition when released.

It is believed that as much as ten to fifteen per cent of the estimated population can safely be moved without hindering the important function of the refuge which is to provide birds for the surrounding area. Trapped birds are placed in individual, burlap-covered crates for moving. Every attempt is made to release birds as soon as possible after capture.

Deer have responded rapidly to the protection and habitat development also. They have increased to the point that plantings of buckwheat, sunflower, and several legumes are not practical. Competition with turkeys for oat pastures and chufas is rapidly becoming more pronounced.

Live trapping for these animals did not get under way until August, 1951, when a corral trap was used unsuccessfully. Later in the fall quarter board deer traps of the conventional design were put in use. Twenty-one deer were removed from the refuge and released on the Sumter National Forest in Edgefield County. Seven additional animals were removed from an enclosure near Columbia and released in this same area. No follow-up work has been done on releases of deer or turkeys.

Crabapples and mistletoe have proved to be the best baits for deer so far.

Raccoons build up rapidly in our section of the State, and continued live trapping is used to keep the population under control. They are destructive to food plantings, compete with turkeys and deer for the native and cultivated foods, and serve as predators on nests of the wild turkey. The live trap used in this work was developed by personnel on the trapping project. Quite a large variety of species in addition to raccoons have been taken with it. These include: opossums, skunks, ducks, a variety of song birds, snakes, and even a 3' alligator.

The best baits so far have been cull hatchery eggs, green corn, dry corn, chufas, cooked mash, bread and smoked herring.

The project has released over 360 raccoons in the counties of the upper part of the state. Approximately 250 of these were taken from the refuge. Three of the animals have been of the unusual yellow color phase.

## RESULTS

The increase in the turkey population since vigorous protection and development were afforded has been gratifying. No census of the birds on the refuge has been made, and estimates based on casual observations are the only figures available by which to measure this trend. In 1949 during the second year the project was in operation, the project leader estimated the population at 300 birds. In the winter of 1952, three years later, project personnel estimated a population of 800 to 900 birds for the 17,000 acres. During the winter of 1951 - 52 there were at least three large flocks with from 30 - 50 birds in them. Last year on one

occasion when the birds were in their largest droves, as many as 100 turkeys were seen in a field that contained both chufas and oats. Observations and reports indicate that the birds have not been drawn from the surrounding area, since more birds are seen outside the refuge than have been observed in many years.

Deer have also increased prodigiously, but this increase does not appear general outside of the refuge as does that of turkeys.

Most small game species have increased except the quail population, which has remained low. With the exception of deer and turkeys, doves have appeared to profit most from the management operations.