

Prescribed Burning on the St. Marks National Wildlife Refuge

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PRESCRIBED BURNING is an important management tool on the St. Marks National Wildlife Refuge. Benefits in terms of protection from wildfires, increased food supplies for game, and forest tree disease control are considered to be strong justifications for the program.

While burning is considered to be an integral part of our refuge program, conducting the burning program to achieve the desired benefits is easier said than done. St. Marks is a complex of several ecological types, each with varying types of fuels. In a broad sense, there are four general classes of fuels present: (1) litter and grasses, (2) saw palmetto, (3) wax myrtle and gallberry, and (4) palm trees, vines, and young pines. The intensity of a prescribed burn varies according to the moisture content, wind, and the particular vegetative type or combination of types that is being burned. Because of the uncertainty of burning conditions, desired results have not always been achieved.

HISTORY

The history of fire on refuge lands prior to the time the refuge was established is vague. Old-timers report that the woods were set afire by grazing interests with no effort made to control the burn.

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Since marsh lands also provide browse for cattle they too were burned.

When the St. Marks and Panacea Units were brought into the refuge system in 1931 the practice of indiscriminate burning was discontinued. The Wakulla Unit was added to the refuge in 1936. All merchantable timber had been removed from refuge lands immediately prior to acquisition or in the case of the Wakulla Unit, a timber reservation was given to the owner from whom the land was purchased to permit him to remove additional timber. The refuge was thus largely dominated by newly established stands of timber and there was a need for complete protection from fire during the early years. During the period 1931 to 1941 about 300 miles of fire breaks were plowed and maintained to protect against wildfires. Even so, fires did occur and in one case a fire burned out of control for three days.

As the extent and frequency of fires were reduced on the refuge by improved protection, a decided decrease in the upland game populations and in waterfowl use of the marshes became evident. It soon became apparent that burning could be an important management tool in maintaining desirable habitat conditions for both upland game and waterfowl. The first recorded prescribed burn on the refuge was an experimental marsh burn accomplished during the 1940-41 winter season. One hundred twenty acres were burned and good goose use was reported on the new growth.

BURNING PROGRAM

With the recognition that fire could be beneficial as a management tool if used properly, a formal plan for burning was adopted. The plan was broad in scope, reflecting the benefits that could be derived if the program were carried out on a continuing basis. For each burn, the plan called for a detailed reporting of wind direction, wind velocity, and time of day, followed by information relative to the number of miles of control lines plowed, the man-hours worked and the acreage burned. From these data evolved improved burning procedures and a more efficient operation. Experience gained by



FIG. 1. Prescribed burning marshland on St. Marks Refuge. Angle of the smoke indicates ideal wind conditions.

25 years of burning serves as the basis for the procedures which we use today.

WEATHER

What may be ideal burning weather five miles north of the refuge is not necessarily true for the refuge. It has been our experience that the nearer one is to the Gulf of Mexico, the more variable weather conditions become. The staff members most familiar with the St. Marks burning program say, "If the wind does not change by 2 o'clock it will hold for the remainder of the day." The saying has merit. However, with so many variables to consider, you might say that our burning program can be likened to the old-time bush pilots—we are flying by the seat of our pants.

When the weather reports are favorable for burning the following procedure is used. The crew is alerted on days that are predicted to be ideal. One man obtains the weather data and visits the area prepared for burning. The moisture content of the fuel is checked and a judgment is made regarding wind direction and velocity. If conditions appear stable, the crew is dispatched to the burning area. No burning is done without a standby fire suppression unit and

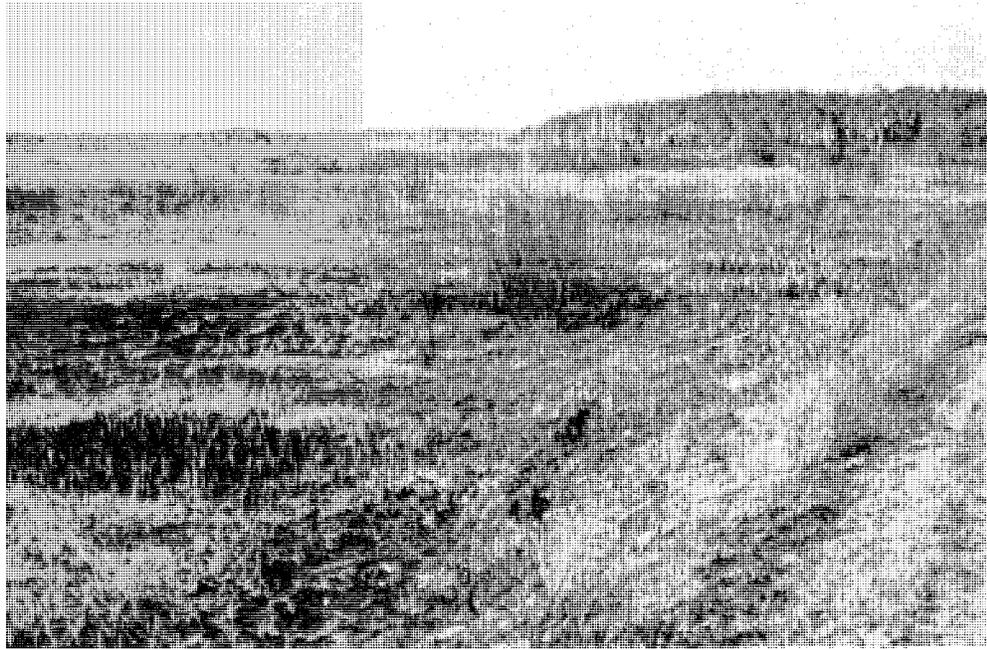


FIG. 2. Appearance of marshland immediately after burning. A good stand of wild millet (*Echinochloa walteri*) followed this burn.

without first firing a control line to observe the fire's behavior. When conditions have been determined satisfactory, the remainder of the control lines are set. If the behavior of the fire is contrary to what is expected, the fire is suppressed.

REFUGE UNITS—ST. MARKS

Of the three units on the refuge, the St. Marks Unit accumulates the greatest tonnage of fuel over a given period. Four broad ecological types occur on this unit: (1) Pine Flatwoods, (2) Hardwood Hammocks, (3) Fresh Water Marshes, and (4) Salt Water Marshes.

Due to the fuel associated with this area, only back fires are used, except in some of the isolated areas where access is by boat. The isolated wooded areas are burned with head fires, following a substantial rain. Fresh water and salt water marshes are also burned with head fires. Even with the ability of the land to produce an abundance of fuel, it is not possible to conduct a burn every year. Where there is a heavy cover of palmetto, a three-year accumulation of fuel is normally required for a successful burn. This also



FIG. 3. Same area as Figure 2 after flooding. Waterfowl utilization of wild millet and other aquatic vegetation continued good for two years.

holds true for the two types of marshes. For example, two individual marshes were burned in 1964 and another burn would have been desirable on each in 1965. Two attempts were made in 1965 on the first area without success. Three attempts were made to burn the second area, and results were a 25 per cent burn.

WAKULLA UNIT

On the Wakulla Unit, where elevations are higher, the vegetative types consist of: (1) Deep Sand Ridges, (2) Hardwood Hammocks, (3) Pine-Live Oak Ridges, (4) Pine Flatwoods, and (5) Salt Water Marshes. The fuel accumulates fairly heavily but cannot be burned except on a three-year rotation. Back fires are used in the wooded areas while head fires are used on the marshes.

PANACEA UNIT

The Panacea Unit is composed for the most part of deep sand ridges interspersed by fresh water lakes and ponds. Most of the fuel

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on this unit is light, and as a result, does not generate much heat. With this type situation, most of the acreage can be burned with a head fire. We believe that it is advantageous in most instances to burn with a head fire, to push the fire through the thick growth of titi which grows around the perimeter of the lakes and ponds. The sawgrass marshes also burn best with a head fire.

The Panacea Unit is currently being restocked. The plan calls for a regeneration of the longleaf pine-scrub oak ridges on a 60-40 basis. This is to provide a basal area of 60 per cent pine and 40 per cent oaks. This distribution will permit orderly burning and will provide for the maintenance of an adequate mast crop for wildlife.

WILDLIFE BENEFITS

Prescribed burning is also a management tool which benefits waterfowl. Our records show that geese prefer marsh areas which have been burned. Burning, followed by flooding, is a technique often employed to retard or control pest plants in fresh and brackish water marshes. The effectiveness of fire in marsh management often depends on the ability to flood burned marshes before new growth starts.

Other forms of wildlife gain tremendously by burning. The history of wildlife populations on the Wakulla Unit clearly shows the benefits of fire when used judiciously. In the early days of the refuge, with complete protection from fire, this unit supported decreasing populations of upland game species.

A study of the turkey population in the early 1940's revealed that turkeys seemed to prefer lands outside the refuge boundary which were being burned to improve conditions for cattle and hogs. After prescribed burning practices were initiated on the refuge, a noted increase in the turkey population was observed.

The Panacea Unit has been the best upland game area on the refuge. Although protected from fire, the deep sand ridges afford fair habitat. It is our hope that forest game populations can be raised by restoring the area to a 60-40 ratio of pine and oak. This

BURNING ON ST. MARKS REFUGE

should be particularly beneficial to the fox squirrel which prefers mature pine woods.

The St. Marks Unit has the ability to produce an abundance of fuel and as a result of prescribed burning, game populations are increasing. Very little turkey sign has been observed in this unit until recent years. The increases are credited to the burning program. The deer population also appears to be on the increase.

ATTITUDES

As with every endeavor, there are those who are in favor of burning and those who are opposed. Some of the most severe criticism of our burning program has come from ornithologists and sight-seers. Whenever possible, these persons are shown a comparison of bird life on unburned and burned areas, after which they often admit that a burning program has merit. Criticism has also come from foresters who do not like to see seared trees. It is estimated that less than one per cent of the seared trees are lost. The trees that do die are often stagnated or suppressed and we do not consider such losses significant.

In summary, it has been demonstrated that the benefits derived from a prescribed burning program are definitely significant from both a wildlife and a timber management standpoint. Prescribed burning at St. Marks accomplishes the following:

1. Reduces wildfire hazards.
2. Improves conditions for wildlife by:
 - (a) reducing the dense ground growth of perennial grasses and shrubs, leaving conditions suitable for legumes and annual weeds to become established.
 - (b) removing small understory pines and hardwoods that are of little value either for game or for timber.
3. Controls brown spot disease in young longleaf pine stands.
4. Fits well into a multiple-purpose timber and wildlife management program.