

Introduction

The Ecology of Fire

Fire has played a major role in determining the distribution of plants across the South. Some plant communities such as cypress swamps survive for centuries between prolonged droughts that finally allow stand-replacement fires to enter. Other communities such as the once vast expanse of longleaf pine burn every few years. In fact some ecosystems, for example the longleaf pine-wiregrass association, require periodic fire for their very survival.

A basic premise of fire ecology is that wildland fire is neither innately destructive nor constructive: it simply causes change. Whether these changes are viewed as desirable or not depends upon their compatibility with one's objectives. Irrespective of man's view-

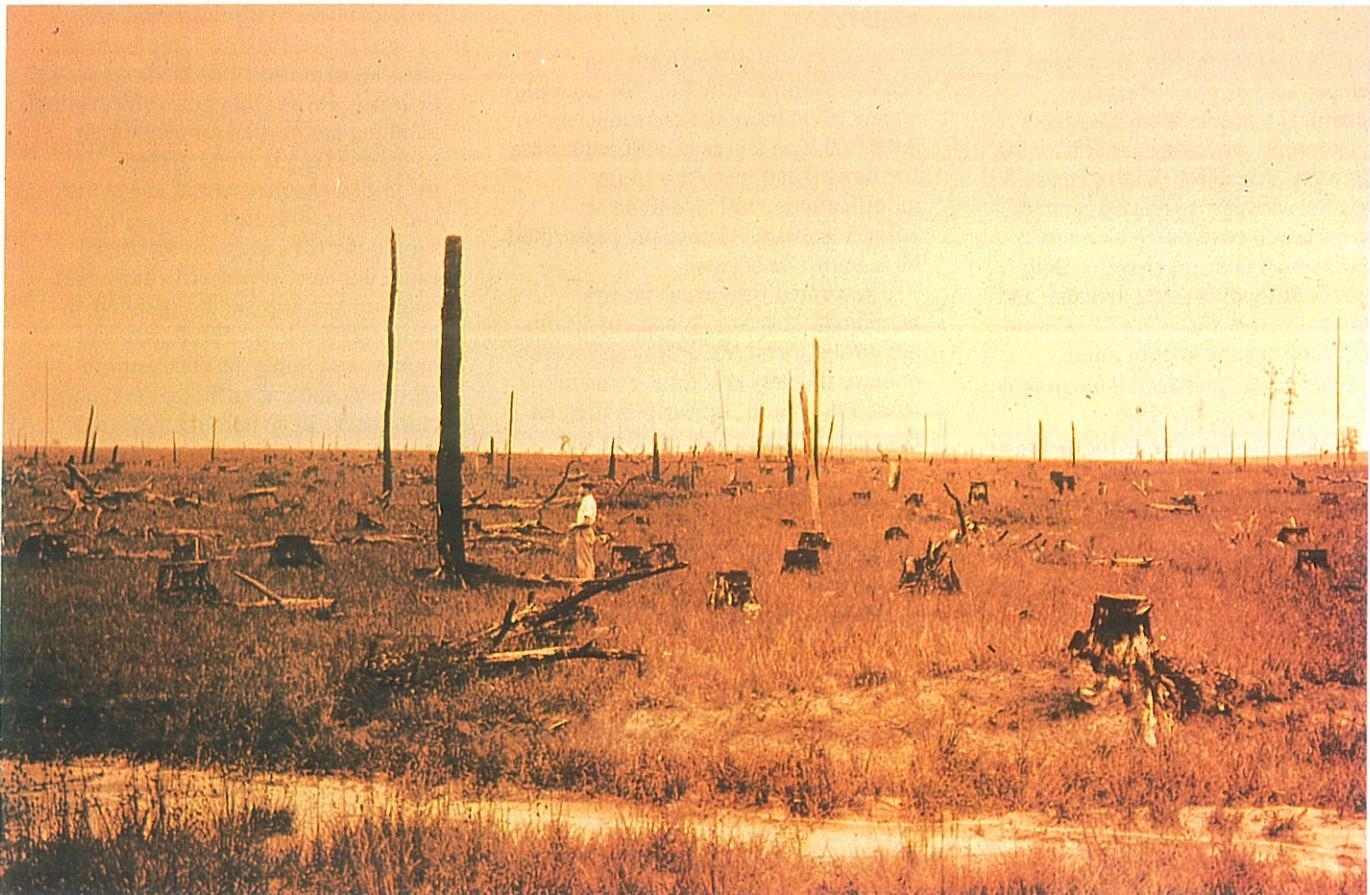
point, change is biologically necessary to maintain a healthy ecosystem. Resource managers have learned to manipulate fire-caused changes in plant and animal communities to meet their needs, and those of humankind in general, while at the same time preserving underlying natural processes and functions. They do this by varying the timing, frequency, and intensity of fire.

Prescribed Fire History

The use of fire in the forests of the United States has come full cycle. Early settlers found Indians using fire in virgin pine stands and adopted the practice themselves to provide better access, improve hunting, and to get rid of brush and timber so they could farm. Annual burning to "freshen up"

southern range became a custom. This practice, plus destructive wildfires after logging left millions of acres of forest land in the south devoid of trees.

The increasing wildfire problem coupled with the need for a fire-free interval of several years to allow the pines to become reestablished led many foresters to advocate the exclusion of all fire from the woods. Others, however, pointed out that fire might have a place in the management of longleaf pine. Fire has been used by professional foresters to reduce hazardous fuels since the turn of the century. The misconceptions and controversy surrounding the deliberate use of fire to achieve resource management objectives have slowly been replaced by facts. As knowledge accumulated, the use of prescribed fire grew.



Depression-era photo of unproductive forest land



Grid ignition



Smoke obscuring highway

Present Use

Today prescribed fire is applied to roughly 8 million acres in the South each year — about half of which are burned to achieve various forest management objectives. Most of the remainder is for range and agricultural purposes. Prescribed burning is a desirable and economically sound practice on most southern pine sites. In many cases, prescribed burning is the only practical choice. Few, if any, alternative treatments have been developed that can compete with fire from the standpoint of effectiveness and cost. Chemical applications generally cost more than 10 times as much per acre as prescribed fire. Mechanical treatments such as disk-ing, chopping, or raking are at least 20 times more expensive. Each of these three alternatives also has associated environmental costs, such as destruction of habitat and soil erosion. Both the probability of causing damage, and the magnitude of such damage, should it occur, need to be kept in mind.

In this guide, *prescribed burning is defined as fire applied in a knowledgeable manner to forest fuels on a specific land area under selected weather conditions to accomplish predetermined, well-defined management objectives.*

This manual will be most useful in the lower Piedmont and Coastal Plain. Prescribed burning in these areas has been perfected by several generations of resource managers. Although the potential of prescribed fire in the upper Piedmont and mountains of the South has been demonstrated, few guidelines exist. If you are interested in the emerging use of fire in the mountains, a good source of information and help is your local State or Federal forestry office.

Impact of Prescribed Burning

A single prescribed burn can achieve multiple benefits. For example a prescribed burn that consumes more dead fuel than it creates will reduce the fire hazard and, with few if any modifications, will also improve wildlife habitat. Almost any prescribed burn improves access.

Prescribed fires aren't always beneficial, however. When conditions are wrong, prescribed fire can severely damage the very resource it was intended to benefit. Prescribed fire can temporarily reduce air quality, but usually to a much lesser degree than wildfire. For every prescribed fire opportunity, there are tradeoffs that should be recognized and carefully weighed before a decision is reached. Proper planning and execution are

necessary to minimize any detrimental effects to air quality. Potential off-site impacts such as downstream water quality should be carefully considered, as should on-site impacts to soil and aesthetics.

Public opinion is another factor to consider because the general public is concerned about the deterioration of the environment. Smoke from prescribed fires, as well as from wildfires, is highly visible. It is our job as resource managers to inform the public of the differences between prescribed fire and wildfire—which often look identical to the untrained eye.

Prescribed fire is a complex tool and should be used only by those trained in its use. Proper diagnosis and detailed planning are needed for every area where burning is contemplated. The incomplete assessment of any factor can pose serious liability questions should the fire escape or its smoke cause damage. A prescribed fire that does not accomplish its intended objective(s) is a loss of both time and money, and it may be necessary to reburn as soon as sufficient fuel accumulates. Keep in mind that some resource management objectives can be met with a single fire, some require several fires in fairly quick succession, and some can only be accomplished by burning periodically throughout the rotation.