

Prescribed Fire: Promoting Better Forest & Wildlife Management

► In this four-part series, you will learn the importance of prescribed fire for forest and wildlife management. Specific elements covered will be site conditions, weather, and timing.

In 1942, R. M. Canarro, writing in the *Journal of Forestry*, defined prescribed burning as “burning to a prescription which prescribes the area to be burned, the degree of burn, the method and time. Simple, concise, effective, leaving no room for criticism, for controversy, for misunderstanding.”

Prescribed fire has been a part of land management across most of the South for as long as people have been living here. In 1982, fire historian Stephen Pyne noted that the South has long dominated national fire statistics, leading in both frequency and acreage burned. Its fire history is a history of its fuels. The forest understory with its tall grass, hardwood saplings, reproduction, and vines provides the fuel for woods fires. The regular firing of the woods prevented fuel buildups that encouraged episodic fires elsewhere, and the fire history of the South is remarkable for the absence of conflagrations until the advent of industrial forestry in the early to mid-1900s.

Fire was once one of the most common, ecologically important natural disturbances in North America and, despite anthropogenic disruptions, remains vital for creating and maintaining many ecologically significant terrestrial ecosystems.

Prescribed burning has long been used as a forest management tool, but only lately has the concept of a fire regime formally been applied to meet management goals. Burn frequency may have been the major factor in determining relative abundances of pines in the Southeast before European settlement, and that fire regime factor has garnered the most attention in management. It has been estimated that most locations in the upland landscape burned on average every two to five years, but at some sites and/or during some time periods, fire frequency varied. Over many decades, differences in frequency of as small as one year may alter the landscape.

Fire regimes include many factors in addition to burn frequency: month of burn, day of burn weather, ignition

pattern, and fuel type or load among others. Shifts in any combination of the burn regime elements have the potential to alter the landscape. In the modern landscape, sites with altered vegetation or fuel are of special concern.

Figure 2 illustrates the difference in the structure of a southern pine forest as a result of different prescribed burn frequencies of one to three years, including not burned. The area not burned has a dense midstory of small hardwood species with minimal to no understory vegetation (fig. 2A). The areas burned at two- and three-year intervals do not have the abundance of hardwoods in the midstory as does the unburned area. Rather, they have scattered smaller trees and woody vegetation reaching just above an understory composed of increasingly dense grasses and herbaceous plants (fig. 2B and fig. 2C). The area burned on a one-year frequency has a dense understory of grass and herbaceous plants, and the small trees and brush are illuminated (fig. 2D). Regular burning of these areas has resulted in more open-forest ecosystems compared to areas not burned.

Fire effects will vary depending on the amount and composition of fuel. A burn plan designed to maintain a stand in good health cannot be the same as one needed to recover forest health of a degraded stand.



Figure 1. Wild turkeys are just one of many species of wildlife that benefit from prescribed burning. (Photo credit: Don Chance, Graduate Student, Mississippi State University)

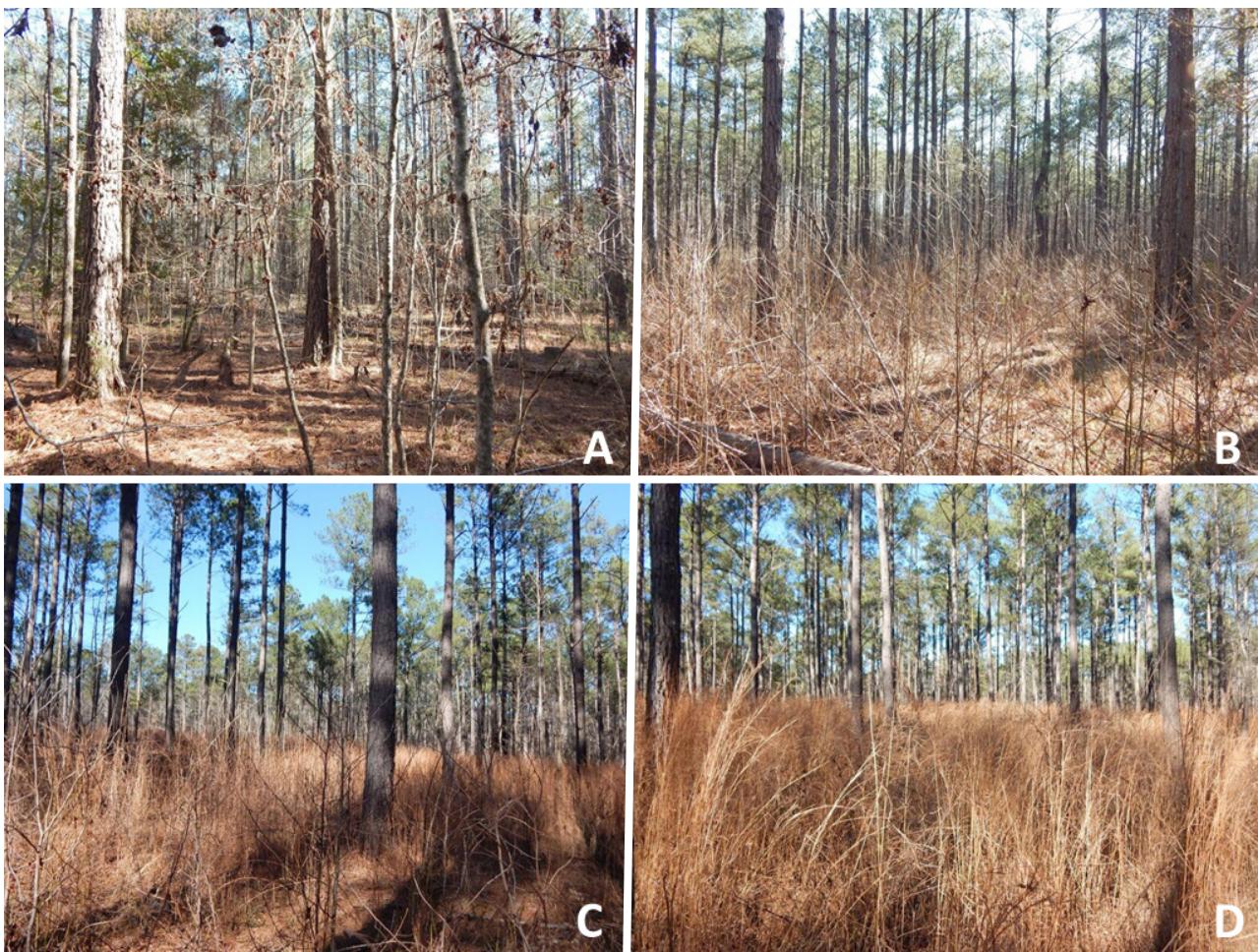


Figure 2. Structural characteristics of a southern pine forest from different intervals of prescribed burning: (A) control–no burn, (B) prescribed burn on a three-year interval, (C) prescribed burn on a two-year interval, and (D) prescribed burn on a one-year interval.

Even when burn plans are appropriate for management objectives, application of fire as a rigid regime does not guarantee management goals will be met. The objective is not to burn but rather to promote forest health via ecological work accomplished by fire.

Prescribed fire is an important management tool throughout Southern forests. It provides multiple benefits for both timber and wildlife.

Benefits of Prescribed Fire

- Reduces fuel loads to prevent catastrophic fire
- Controls low-quality, undesirable competing vegetation to allow establishment of seedlings following planting and increased water, soil nutrients, sunlight, and resource availability for already established trees
- Improves wildlife habitat by creating a more open midstory and understory and improving browse and forage quality and quantity.
- Improves aesthetic values by creating open spaces and increasing the presence of flowering plants and native pollinators.

Along with increasing soil nutrients, controlling competition, reducing hazardous conditions, improving wildlife habitat, and improving aesthetic values, prescribed fire has many other benefits. It can be used to manage insects and disease, improve access for timber operations, and improve forage for grazing opportunities.

The specifics of prescribed fire highly depend on the site, weather conditions, and landowner objectives. The benefits of prescribed fire greatly outweigh its costs if conducted appropriately.

In this series, we discuss the importance of prescribed fire for forest and wildlife management, and, specifically, the important elements, such as site conditions, weather, and timing, involved in conducting a prescribed burn. Many landowners are interested in prescribed burning and are capable of burning their own property but are apprehensive because of uncertainty. These landowners intend to burn, but when the day comes to light the fire, they hesitate because of a lack of knowledge or experience using prescribed fire. Many landowners have expressed a need for a day-of-burn guide to help them determine if conditions are right to burn that day.

Several topics—all of equal importance—will be covered in this series. Descriptions of each article follow. This series will start with a discussion of the fuels and the importance of having some idea of what will be burned during a prescribed fire.

Prescribed Fire: Fuels

Fuels are defined as any living or dead plant material that can be ignited by a fire. How a fire will burn is often based on the volume, arrangement, shape, size, and moisture content of the fuel. These characteristics are all interrelated. They affect each other and strongly influence fire behavior and the resulting effects of the fire. How fuel and its characteristics affect fire behavior will be discussed.

Prescribed Fire: Weather

To execute a safe and successful prescribed burn, an understanding of several important weather elements is essential. Wind, relative humidity, temperature, and precipitation are the important elements to consider when planning a prescribed burn. The importance of each of these elements, desirable burning ranges for each, and the potential impacts of these conditions on the day of a burn will be described.



Figure 3. Prescribed fire conducted in a one-year fire return interval plot at the Mary Olive Thomas Demonstration Forest in Auburn, Alabama.

Prescribed Fire: Time of Year

Depending on the objectives of conducting a prescribed burn and the conditions of the site to be burned, it may be best to burn during the growing season or during the winter months. In general, most prescribed burning objectives can be accomplished during the winter months. However, burning during the growing season when temperatures are hotter may be beneficial or necessary. The effects of the time of year a prescribed burn is conducted and how to determine when to burn based on the goals and objectives of conducting a prescribed burn will be discussed.



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