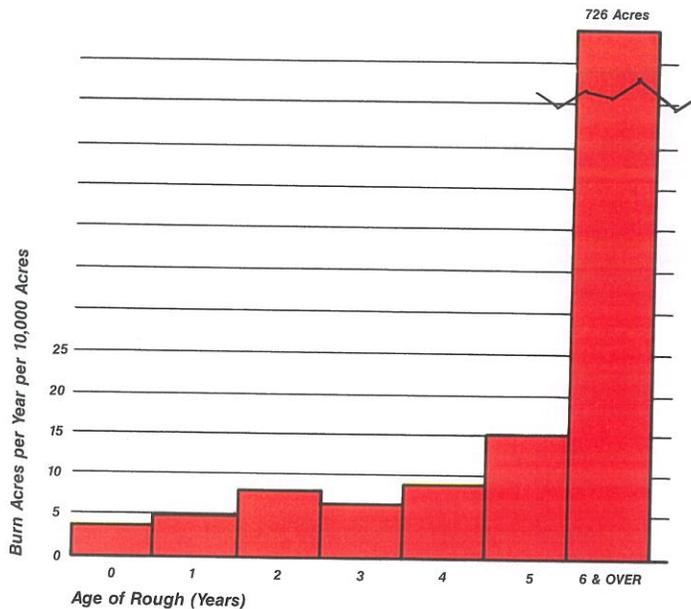


# Reasons

## For Prescribed Fire In Forest Resource Management

- Reduce hazardous fuels
- Prepare sites for seeding and planting
- Dispose of logging debris
- Improve wildlife habitat
- Manage competing vegetation
- Control disease
- Improve forage for grazing
- Enhance appearance
- Improve access
- Perpetuate fire-dependent species
- Cycle nutrients
- Manage endangered species



Annual wildfire acreage depends on age of rough

## Reduce Hazardous Fuels

Forest fuels accumulate rapidly in pine stands on the Coastal Plain. In 5 to 6 years, heavy “roughs” can build up, posing a serious threat from wildfire to all forest resources.

Prescribed fire is the most practical way to reduce dangerous accumulations of combustible fuels under southern pine stands. Wildfires that burn into areas where fuels have been reduced by prescribed burning cause less damage and are much easier to

control. The appropriate interval between prescribed burns for fuel reduction varies with several factors, including the rate of fuel accumulation, past wildfire occurrence, values at risk, and the risk of a fire. The time interval between fires can be as often as every year although a 3- or 4-year cycle is usually adequate after the initial fuel-reduction burn.

The need to reduce hazardous fuel accumulations in the pine plantations of the South is increasing. Without fuel reduction, fire hazard is extremely

high in these vast contiguous stands. The initial hazard-reduction burn in a young pine stand requires exacting conditions of wind, humidity, and temperature. Higher wind velocities and cooler temperatures minimize scorch damage. Southern pine plantations averaging 10 to 12 feet in height can be burned by experienced people under the right conditions without damage. Young plantations on industrial lands are often burned for the first time when they are 15 to 20 feet tall using aerial ignition; close spacing



Winter backing fire in heavy rough



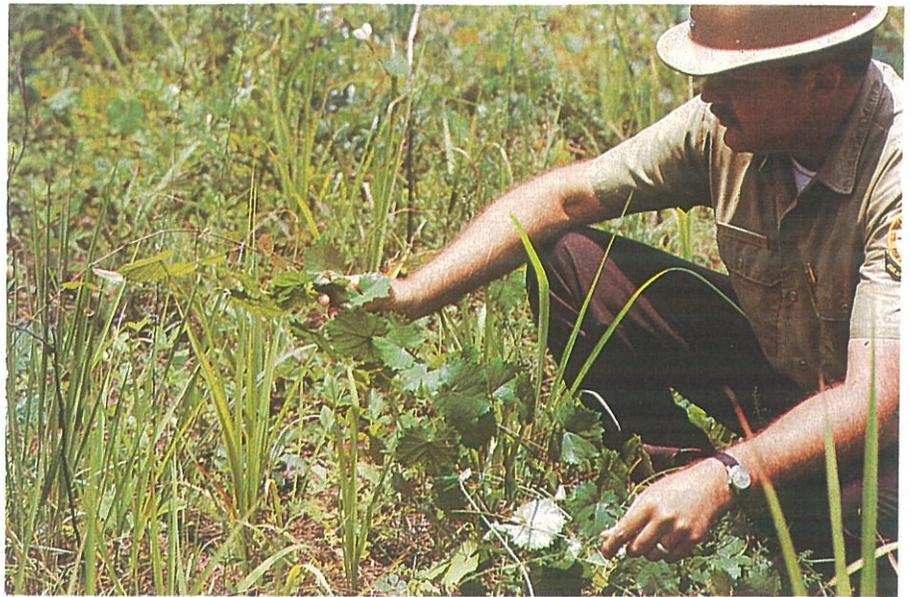
Damaging wildfire in heavy rough

of ignition spots (e.g., 2 chains by 2 chains), and cool, damp conditions with some wind are a must to avoid crown damage.

Subsequent fuel reduction burns need not cover the entire area. The objective is to break up fuel continuity. Fuel reduction on 75 to 80 percent of the area is sufficient. An added advantage of “patchy” burns is that the unburned islands provide cover for wildlife. These unburned patches will not have a dangerous accumulation of fuels at the time of the next burn if they resulted from a lack of fuel during the previous fire. If, however, they were too wet to burn, these islands could result in a hot spot the next time if a heading fire was allowed to sweep through them under appreciably drier conditions. One reason excessive crown scorch should be avoided is because, under some circumstances, it can add more fuel to the forest floor than the fire consumed.

## Dispose of Logging Debris

After harvest, unmerchantable limbs and stems are left either scattered across the area or concentrated at logging decks or delimiting gates, depending upon the method of logging. This material is an impediment to both people and planting equipment. If a wildfire occurs within the next few years, fireline construction can be severely hindered; the result being larger burn acreages and higher regeneration losses. Although not all large material will be consumed by a prescribed fire, what is left will be exposed so it can be avoided by tractor-plow operators. In stands that produce a large amount of cull material, the debris is often windrowed and burned. This practice should, however, be avoided whenever practical because of smoke management problems and the potential for site degradation. Broadcast burning is generally a much better alternative. If the debris must be piled before burning, construct round “haystack” piles when the debris and underlying ground are both fairly dry. This step will limit the amount of dirt in the pile. Piles containing large amounts of dirt can seldom be burned efficiently. They almost always smolder for long periods, creating unacceptable smoke problems.



*Prescribed fire can improve wildlife habitat*

In some cases overstory pines are left during harvest as seed trees, and in others an unevenaged management system such as shelterwood is used. In both situations, the logging debris can still be burned, but you must take more care to protect the remaining trees.

## Prepare Sites for Seeding or Planting

Prescribed burning is useful when regenerating southern pine by direct seeding, planting, or natural regeneration. On open sites, fire alone can expose adequate mineral soil and control competing vegetation until seedlings become established. Where competing vegetation cannot be adequately reduced by fire, follow up with mechanical or chemical treatment. The fire will improve visibility so that equipment operators can more easily see the stumps of the harvested trees, as well as any other hazards. In addition, if the area is to be bedded before planting, burning first consumes much of the debris. The result is more tightly packed beds and thus better seedling survival. Where herbicides are used to kill competition, subsequent burning will give additional vegetation control. This step also permits more efficient and easier movement of hand-planting crews. Prescribed fire also recycles nutrients, making them available for the next timber crop.

For natural regeneration, knowledge of anticipated seed crop and date of earliest seed fall is essential. If the

seed crop is inadequate, burning can be postponed. Complete mineral soil exposure is not necessary or desirable; a thin layer of litter should remain to protect the soil. Generally, burning should be done several weeks prior to seed fall. Timing varies with species and locality.

## Improve Wildlife Habitat

Prescribed burning is highly recommended for wildlife habitat management where loblolly, shortleaf, longleaf, or slash pine is the primary overstory species. Periodic fire tends to favor understory species that require a more open habitat. A mosaic of burned and unburned areas tends to maximize “edge effect” which promotes a large and varied wildlife population. Deer, dove, quail, and turkey are game species that benefit from prescribed fire. Habitat preferences of several endangered species, including the Florida panther, gopher tortoise, indigo snake, and red-cockaded woodpecker are also enhanced by burning. Wildlife benefits from burning are substantial. For example, fruit and seed production is stimulated. Yield and quality increases occur in herbage, legumes, and browse from hardwood sprouts. Openings are created for feeding, travel, and dusting.

Selecting the proper size, frequency, and timing of burns is crucial to the successful use of fire to improve wildlife habitat. Prescriptions should



**Summer burn for hardwood control**



**Hardwood topkill after summer burn**

recognize the biological requirements (such as nesting times) of the preferred wildlife species. Also consider the vegetative condition of the stand and, most importantly, the changes fire will produce in understory stature and species composition.

## Manage Competing Vegetation

Low-value, poor-quality, shade-tolerant hardwoods often occupy or encroach upon land best suited to growing pine. Unwanted species may crowd out or suppress pine seedlings. In soils with a high clay content and in areas with low rainfall during parts of the growing season, competition for water, nutrients and growing space may significantly lower growth rates of the overstory. Furthermore, understory trees and shrubs draped with dead needles and leaves act as ladder fuels allowing a fire to climb into the overstory crowns. In most situations, total eradication of the understory is neither practical nor desirable.

However, with the judicious use of prescribed fire, the understory can be managed to limit competition with desired species while at the same time providing browse for wildlife.

Burning is most effective in controlling hardwoods less than 3 inches in diameter at the ground line. Periodic fires throughout the rotation can keep competing vegetation below this 3-inch threshold. The most desirable season for burning and the frequency of burns will vary somewhat by species and physiographic region. Generally, a winter (dormant season) fire results in less root kill than a late spring or summer burn. **One system recommended in both the Piedmont and Coastal Plain is a dormant season burn to reduce initial fuel mass, followed by two or more annual (if enough fuel is present) or biennial summer burns.**

If not controlled, the hardwoods will form a midstory and capture the site once the pine is harvested. If a large pine component is wanted in the next rotation, these unmerchantable hardwoods must be removed during site preparation — an expensive

proposition. Generally, fire is required in combination with other treatments involving heavy equipment, chemicals, or both. In many locations the preferred system is a combination summer burn and herbicide treatment.

However, in the lower Appalachians of South Carolina, another relatively inexpensive technique is employed. All residual hardwoods are felled and the area broadcast burned under exacting fuel and weather conditions.

## Control Insects And Disease

Brownspot disease is a fungal infection that may seriously weaken and eventually kill longleaf pine seedlings. Diseased seedlings tend to remain in the grass stage. Control is recommended when more than 20 percent of the seedlings are infected or when some of the diseased seedlings are needed for satisfactory stocking. Once the seedlings become infected, burning is the most practical method of disease control. Any type of burning that kills



**Longleaf pine infected with brownspot needle blight**



**...and after prescribed fire**

the diseased needles without killing the terminal bud is satisfactory. Burning the infected needles reduces the number of spores available to infect the seedlings. Generally a fast-moving winter heading fire under damp conditions, as exist after passage of a strong cold front, is best. Height growth of the seedlings often begins the first postfire growing season.

Reinfection usually occurs quickly if there are infected seedlings in unburned areas near the burned area. If reinfection occurs, additional burns may be needed. However, longleaf is most susceptible to fire immediately after it comes out of the grass stage. Therefore, a reburn will likely kill some seedlings, so such a decision should be made in consultation with

experienced personnel. Your local State forestry office is a good place to begin.

Prescribed burning seems to reduce problems from *Fomes annosus* root rot. This fungal disease is less frequent where periodic burns have reduced the litter. The fire alters the microenvironment of the forest floor and perhaps destroys some fruiting bodies and cauterizes tree stumps.

Prescribed fire has been successfully used under very exacting fuel and weather conditions to control cone insects such as the white pine cone beetle (*Conophthorus coniperda*) while the pest is overwintering in cones on the ground. Prescribed burning costs much less than traditional chemical control methods used to control this beetle.

## Improve Forage for Grazing

Prescribed burning improves grazing in open pine stands on the Coastal Plain. Low-intensity burns increase availability, palatability, quality, and quantity of grasses and forbs. Dead material low in nutrient value is removed while new growth high in protein, phosphorus, and calcium becomes readily available. These benefits are manifested in increased seasonal cattle weight gains. Cattle congregate on recently burned areas so burn location and size must be carefully selected to prevent overgrazing. One commonly used system is to divide the range into three parts and burn one third every year.

A plant may become more — or less — abundant after a fire. The result depends on the stage in the plant's life cycle at the time of the fire. Flowering dates vary among species and with latitude and elevation within a species' range. Therefore, observe these dates for the preferred species, and time the burn accordingly. For example, wiregrass responds much better to summer burns than it does to dormant season burns.

## Enhance Appearance

Prescription burning improves recreation and aesthetic values. For example, burning maintains open stands, produces vegetative changes, and increases numbers and visibility of flowering annuals and biennials. Burning also maintains open spaces such as mountain balds, and creates vistas. Unburned islands increase vegetative diversity which attracts a wider variety of birds and animals. A practical way to maintain many visually attractive vegetative communities and perpetuate many endangered plant species is through the periodic use of prescribed fire.

Using fire to manage landscapes and enhance scenic values requires judiciously planned and executed burns, especially where exposure to the public is great. Burning techniques can be modified along roads and in other heavily used areas to ensure low flame heights, which in turn will reduce crown scorch and bark char while still opening up the stand and giving an unrestricted view.



Prescribed fire improves range habitat



Warm-season grasses promoted by summer burning

## Improve Access

Burning underbrush prior to the sale of forest products improves the efficiency of cruising, timber marking, and harvesting. Removing accumulated material before harvesting also provides greater safety for timber markers, loggers and naval stores operators due to better visibility and less underbrush. The reduced amount of fuel helps offset the greater risk of wildfire during harvesting. Moreover, the improved visibility and accessibility often increase the stumpage value of the products. Hikers and other users also benefit from easier travel and increased visibility. Hunters are more likely to get a clear shot.

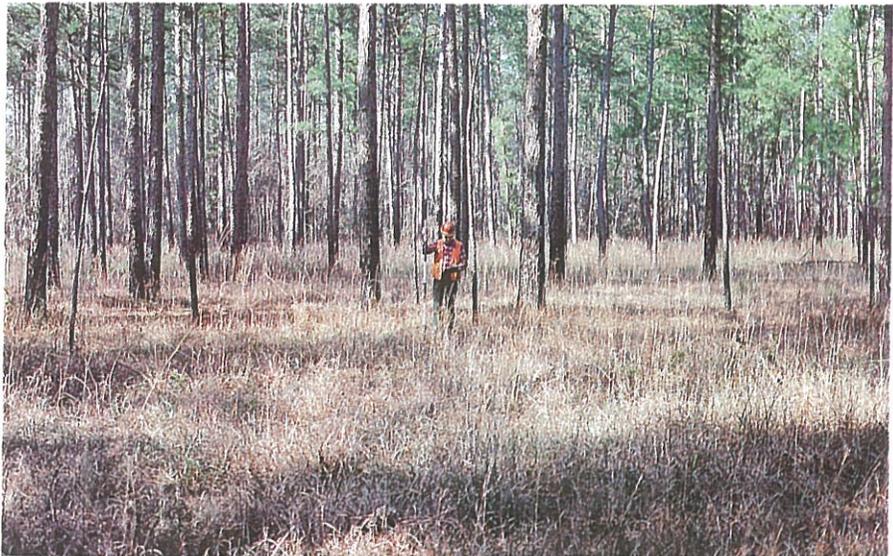


*Limited access due to fire exclusion*

## Perpetuate Fire-dependent Species

Many plants have structural adaptations, specialized tissues, or reproductive features that favor them in a fire-dominated environment. Such traits suggest a close association with fire over a very long period of time. Many endemics are only found the first 1 to 2 years after a fire. Changes in the “natural” fire pattern as a result of attempted fire exclusion have led to dramatic decreases in many of these fire-tolerant or fire-dependent species. Many picturesque flowers, including several orchids, currently listed as threatened or endangered are benefited by fire.

Prescribed burning, however, does not automatically help perpetuate plant and animal species because fires are not necessarily conducted during the same season in which the site historically burned. The interval between prescribed fires as well as fire intensity may also differ from those of the past. The individual requirements of a species must therefore be understood before a fire can be prescribed to benefit that species.



*Open stand resulting from annual winter burning*



*Pitcher plants respond to prescribed fire*

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*Prescribed Burning =  
Good Wildlife Habitat*

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