NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

PRESCRIBED BURNING

(ACRE)

CODE 338

DEFINITION

Applying controlled fire to predetermined area.

PURPOSES

- Control undesirable vegetation.
- Prepare sites for harvesting, planting or seeding.
- Control plant disease.
- Reduce wildfire hazards.
- Improve wildlife habitat.
- Improve plant production quantity and/or quality.
- Remove slash and debris.
- Enhance seed and seedling production.
- Facilitate distribution of grazing and browsing animals.
- Restore and maintain ecological sites.

CONDITIONS WHERE PRACTICE APPLIES

On forestland, native pasture, pastureland, wildlife land, hayland and other lands as appropriate.

CRITERIA

General Criteria Applicable to all Purposes

The procedure, equipment, and the number of trained personnel shall be adequate to accomplish the intended purposes as stated in the burn plan. The timing of the burn will be based on, as a minimum: relative humidity, wind conditions, air temperature, and fuel conditions.

The expected weather conditions, the impact of heat and smoke on human and vehicular traffic, liability (e.g., utility lines) and safety and health precautions shall be integrated into the timing, location and expected intensity of the burn.

Timing of burning will be commensurate with soil and site conditions to maintain site productivity and minimize effects on soil erosion and soil properties (structure, soil moisture).

Comply with applicable federal, state and local laws and regulations during the implementation of this practice, including the forest practices guidelines.

Prescribed burning must:

1. Have a written burn plan prepared by a certified prescribed Fire Manager.
2. The burn must be conducted under the supervision of a certified prescribed Fire Manager.

Certified prescribed fire manager include consulting foresters, contractors, landowners, industrial foresters, S.C. Forestry Commission, or other agency personnel who have satisfactorily completed prescribed burner training and obtained certification from the SC Forestry Commission. Policy for NRCS participation in prescribed burning is found in the National Range Handbook.

Adjoining landowners, local fire departments, and public safety officials within the air shed must be notified prior to burning.

Liability and safety precautions are to be planned before the burn and monitored during the burn.

State Law requires that the SC Forestry Commission be notified prior to conducting the burn.

- Fuel Condition - Burn when fine fuel moisture is from 10 to 20 percent. Burning when the fine-fuel moisture is below 6 or 7 percent can result in damage to plant roots and the soil. When fine-fuel moisture approaches 30 percent, fires tend to burn slowly and irregularly, often resulting in incomplete burns that do not meet desired objectives. Debris from harvested areas should be burned when fuels are dry,

provided soil moisture does not get too low.

- Suitable Soils, Slopes, and Soil Moisture Conditions - Sites with mineral soils can be burned so long as there is adequate soil moisture (Damp soil protects tree roots and microorganisms). Slopes up to 25 percent can be burned with minimum danger of soil movement. Slopes greater that 25% can be burned for site preparation if a high-moisture burn is used. Prescribed burning will not be planned on organic soils.

Humidity, Temperature, and Wind Conditions - Preferred relative humidity is 30 to 55 percent. Burning at relative humidity below 30 percent is dangerous; burning at humidity above 60 percent may not burn hot enough.
The preferred temperature for winter burning is below 60 degrees F. When the objective is to control undesirable species, growing season burns with air temperatures above 80 degrees F. are recommended. If the air temperature is over 85 degrees F, when an over story is present, there will be damage to the over story. Be careful when advising burning with hotter temperatures. Growing season burning late spring when temperatures are 70-80 degrees would be recommended**.**

- The preferred range in wind speed in the stand is 1 to 3 mph (measured at eye level). Wind speed readings for most fire-weather forecasts are taken 20 feet above ground at open locations. The minimum 20-foot wind speed for burning is about 6 mph and the maximum is about 20 mph.
- Time of Day - Prescribed fires should normally be ignited between 10 a.m. and noon. Ground ignition should be stopped before 3 p.m. and aerial ignition before 4 p.m. to allow adequate time for the fire to burn out before atmospheric dispersion conditions deteriorates. Night-time burning is allowed only for reduced fuel levels and when night smoke dispersion is rated fair or good. Separate smoke management guidelines apply.
- Precautionary Measures - Smoke should be kept away from smoke-sensitive areas such as public roads, airports, and populated areas. A proper burning plan considers all aspects of smoke management. All burning should be done in accordance with applicable smoke management guidelines and regulations.
- Avoid smoke where poison ivy is burned.

Additional Criteria to Prepare Sites for Seeding or Planting - High-moisture burns should be used to prevent destruction of organic duff, conserve moisture, and prevent erosion. High-moisture burns may be conducted 2 to 3 days after summer showers.

Burning should be done August - September during a good seed year. Burning for several successive years prior to harvest cutting may be necessary. Longleaf regenerates best on a light litter cover, so burning up to a year in advance is desirable. Loblolly does not need litter cover; so burning just prior to seed fall is satisfactory. Longleaf pine should be burned in the spring of the year in which seeding is expected.

For prescribed burns on planting sites, a hot fire is usually required. Late summer and fall burning is usually prescribed to reduce understory and debris so personnel and machinery can travel safely.

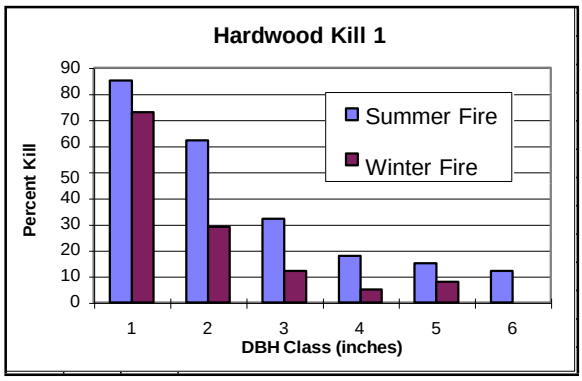
Additional Criteria to Improve Wildlife Habitat - Prescriptions should recognize the biological requirements (such as nesting times) of the preferred wildlife species. Generally, the best season to burn for wildlife benefits is late February or early March. In much of the longleaf habitats of the southeast, fall or growing season burns are appropriate to promote plant species diversity and reduce hardwood competition in pine stands. Frequency of burning varies, but usually is required about once every 2-3 years. The area burned should consist of approximately one-third of the managed area.

For deer, quail, songbirds, reptiles, and pollinators; strips or blocks within the burned area should be left unburned to provide refugia.

Efforts should be made to rake around snags to prevent them from burning as they provide habitat for many wildlife species. If red-cockaded woodpecker nesting or roosting trees are present, fire prevention measures like raking around the base of all nest or roost trees should be conducted.

Additional Criteria to Control Undesirable Vegetation - A winter burn results in less root kill than spring and summer burns, but resprouting is easily controlled by repeating burning while diameters are small. For this reason, burning may be required for several consecutive years. **For reduction of sweetgum coverage, repeated growing season burns may be required if possible.**

The illustration on the following page shows the effects of prescribed burning on undesirable hardwoods by diameter class and season.



Additional Criteria to Control Plant Disease - Burning to control brown spot disease in longleaf pine is recommended when more than 20 percent of the seedlings are infected. Longleaf seedlings are susceptible to brown spot until they reach a height of 3 feet. This condition can be controlled with a fire during the dormant season (December - February). Seedlings should be in the "grass" stage and at least 2 years of age or older. If reinfection occurs, additional burns may be needed.

CONSIDERATIONS

Prescribed burning is a highly technical job requiring knowledge of fire behavior, suppression techniques, and environmental effects of fire.

Burning should be scheduled and managed with consideration for wildlife needs such as nesting, feeding, and cover.

Existing barriers such as lakes, streams, wetlands, roads, and constructed firebreaks are important to the design and layout of this practice.

Consider cultural resources and threatened and endangered plants and animals when planning this practice. Endangered Species Act consultation may be required if a federally listed threatened or endangered species may be affected by the prescribed burn.

Weather parameters and other data that affect fire behavior should be monitored during the burn. Carbon release should be minimized by the timing and burn intensity.

Consider the location of utilities such as electric power lines and natural gas pipelines to prevent damage to the utility and avoid personal injury.

Smoke impacts should be considered before the burn and monitored during the burn.

Prescribed burning should be planned with careful consideration of the effects on residual timber as well as target species. Careful consideration should also be given to the effects on air quality (smoke management), downstream water quality, impacts to soil, and aesthetics.

Time intervals for prescribed burning to reduce wildfire hazards vary with the amount of material on the ground, but a burning rotation of 2-4 years is generally adequate once the initial fuel reduction has been accomplished. Two fires in consecutive winters may be required to reduce the fuel on some areas.

Broadcast burning of logging debris is an inexpensive way to prepare a site for planting as well as reducing wildfire hazard.

Burning underbrush prior to the sale of forest products improves the efficiency of cruising, timber marking and harvesting. Improved visibility and accessibility often increase the stumpage value of the products.

The individual requirements of a species must be understood before a fire can be prescribed to benefit that species.

Prescribed fire can be specified for most southern pine species including loblolly, shortleaf, longleaf, slash, and pond pine. Southern pine bark has good insulating qualities and is thicker than most hardwood species. Pine trees 3 inches or more in ground diameter have bark thick enough to protect the stems from damage by most prescribed fires. Hardwood trees are generally much more susceptible to fire injury than are pines. While it is appropriate to plan prescribed fire where the elimination of hardwoods is the desired result, it should not

be planned for hardwood sites and riparian areas. Use access roads or firebreaks to protect riparian areas and/or hardwood stands from adjacent areas to be burned.

Consideration for seasonal burns:

a. Winter - Most understory burning is done during the winter dormant season.

b. Spring - Variable weather and higher fire danger occur in the spring. Burning could harm nesting wildlife. Pine buds are more exposed and thus more susceptible to heat damage.

c. Summer - Summer burns are used to kill undesirable hardwoods. Mid to late summer is a good time to burn logging debris because the high ambient temperatures help dry out the larger materials. This type burn should be considered for burning hardwoods to successfully create hardwood savannahs or to manage hardwood stands. There are new studies that explain how to achieve great results. See references below and contact the resource staff for assistance. 60 square foot of basal area should be achieved before burning these stands. Attention should be given to air temperatures.

d. Fall - Pines are more likely to die if scorched or roots are damaged at this time.

The principal danger in the use of prescribed fire is smoke. High moisture creates more smoke than low moisture conditions.

Burning can be hazardous to personnel conducting it. Safety is the paramount consideration. Safety measures for personnel include being familiar with the burning plan and having adequate communication, transportation, and protective clothing.

PLANS AND SPECIFICATIONS

A burn plan will be prepared by a certified prescribed fire manager.
Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation. All necessary permits must be obtained before implementation of the practice.

Minimum documentation for this practice includes:

- Forest type to be burned.
- Season of the year to be performed.
- Statement requiring compliance with all federal, state, and local laws.
- Operation and maintenance requirements.
- Copy of prescribed burning plan.

Note: The burning plan is not required for the case file when burning is planned and conducted by the SC Forestry Commission.

As a minimum, the prescribed burning plan will include:

- Landowner name, address, and phone number.
- Acreage to burn and amount (distance) of fire line to construct.
- Purposes
- Specific objectives.
- Site description including present vegetation cover, fuel description, topography and soil.
- Acceptable range of weather parameters and unacceptable weather parameters.
- Preparation of the area for burning.
- Special precaution areas and instructions.
- Equipment/personnel needs/safety requirements.
- Burn execution plan including firing technique and on-site weather.
- Mop-up requirements.
- Post-burn evaluation.

OPERATION AND MAINTENANCE

The kinds and expected variability of site factors (e.g., fuel condition and moisture content, weather conditions, human and vehicular traffic that may be impeded by heat or smoke, liability, and safety and health precautions) shall be monitored during the operation of this practice. Sufficient fire suppression equipment and personnel shall be available commensurate with the expected behavior of these factors during the time of burning to prevent a wildfire or other safety, health or liability incident.

Maintenance shall include monitoring of the burned site and adjacent areas until such time as ash, debris and other consumed material is at pre-burn temperatures.

REFERENCES

1. A Guide for Prescribed Fire in Southern Forests, Technical Publication R8-TR11, USDA Forest Service, 1989.

2. Oak regeneration using the shelterwood-burn technique: management options and implications for songbird conservation in the Southeast. J.Drew Lanham, Patrick D. Keyser, Patrick H. Brose, and David H. VanLear. 2002 .

3. South Carolina Forestry Commission Smoke Management Guidelines.