NRCS Natural Resources Conservation Service
MISSISSIPPI

MS-ECS-338-04 (JS/SS)
Rev. September 2011

PRESCRIBED BURNING - Procedures and Specifications

Purpose:

Prescribed burning is applying a controlled fire to a predetermined area as a management tool. Procedures and specifications are set forth for each vegetative type that may need to be prescribed burned and for each specific purpose that the burn is to accomplish. Vegetative types are based on the same factors which determine plant communities and their descriptions, namely plant species, size classes, and stocking. The more common types encountered in Mississippi are listed and briefly described below.

Prescribed Burning in Forest Stands:

1. Mature pine type, medium to well stocked, with more than 50 square feet of pine basal area per acre; hardwood and brush understory of at least medium density, having the potential of preventing natural regeneration of pine or suppressing such regeneration following harvesting operations.
   Objectives: Control or reduction of encroaching hardwoods, preparation of area for harvest cutting, and preparation of seedbed for natural regeneration.
   Procedures: A winter backfire should be used to reduce initial fuel mass, followed by two or more annual or biennial spring or summer burns, if needed. Winter burn should be done 1 to 3 days after passage of a cold front which has brought ½ to 1 inch of rain and is followed by a cold air mass. Humidity should be no lower than 40 percent. Air temperature should be 40 degrees Fahrenheit or lower. Wind direction should be northerly or northwesterly, with a velocity of 2 to 10 miles per hour and steady. Prescribed fires should be set in the morning as soon as the top layer of duff is dry enough to support a low, steady, creeping backfire (usually around 10 a.m. or later). A burning permit should be obtained and adjoining property owners and the Mississippi Forestry Commission (MFC) County Forester's office notified of intention to burn. A certified prescribed burn manager must be enlisted in planning prescribed burns, plowing the necessary base lines, and actually carrying out the burn. The weather should be checked before starting to burn and periodically throughout the day. Changing conditions, mainly wind should be noted and preparations made to change burning techniques or plow out the fire if an emergency arises. The area should be burned so that the wind will carry smoke away from sensitive areas such as hospitals, schools, and residential areas.

2. Mixed pine-hardwood stands, medium to sparsely stocked, with less than 50 square feet of pine basal area per acre, mainly of sawtimber size, with soil and site well suited for conversion to pure pine.
   Objectives: Conversion of stand to pure pine; control or reduction of competing hardwoods; preparation of site for tree planting, direct seeding or natural seeding.
   Procedures: The same burning techniques as specified for mature pine type should be used. However, in mixed pine-hardwood stands, the hardwoods are usually of poletimber to sawtimber size, (5 inches DBH and larger). Hardwoods 3 inches and larger are rarely killed by fire alone. Two or more annual summer burns following the initial burn might be needed or the unwanted hardwoods could be controlled by applying an approved herbicide. Refer to Timber Stand Improvement (P.C. 666). Conditions of rainfall and soil moisture, humidity, air temperature, wind direction and velocity as specified for mature pine apply also to mixed pine-hardwood. The same precautionary measures should be applied.

3. Immature pine stands, 15 to 40 years old, well stocked with 70 square feet or more of pine basal area, with hardwood understory light to heavy.
   Objectives: Reduction of fire hazards (fuel) and control or reduction of competing hardwoods.
   Procedures: The same burning technique as specified for mature pine should be used. The initial burn may adequately control hardwoods and in such cases no annual follow-up burns will be needed. In young pine stands with heavy grass growth on the forest floor and pine needles draped on tree branches, the initial burn may be made at night when surface fuels are not as dry as in daytime and when air temperatures are lower. In such cases, the risk of an unduly high scorch line is minimized. Following the initial burn, follow-up burns should be scheduled every 3 to 4 years to reduce rough and control unwanted hardwoods. Other conditions and precautionary measures are the same as those specified for mature pine.

4. Young pine stands, less than 15 years old, densely stocked with 600 or more stems per acre, with dense grass and weed growth and heavy accumulation of pine needles and cured herbage on the forest floor.
   Objectives: Reduction of fire hazards (rough reduction).
   Procedures: A winter backfire should be used just after a cold front passage when air temperature is below 40 degrees Fahrenheit; wind is steady, northerly, and 2 to 10 miles per hour in velocity; humidity is 50 to 60 percent and moisture of the litter layer is 25 to 30 percent. Flame height should not be more than 3 feet. Interior plowed lines should be about 400 to 700 feet apart. The prescribed burn should "back burn" against the direction of the wind at a rate of 60 to 100 feet per hour. After the initial burn, follow-up burns should be scheduled every 3 to 4 years, depending on fuel accumulation and presence of competing hardwoods. The same precautionary measures as for mature pine stands should be taken. Under no circumstances should the initial prescribed burn be applied to stands in which the trees are less than 15 feet in height.

5. Young longleaf pine seedling stand in grass-stage, usually natural but possibly planted, 2 to 10 years old, and when more than 30 percent of the seedlings are infected with brown-spot needle blight.
   Objectives: Primarily to scorch infected needles and kill the causative fungus. Also, to remove cured grasses, pine needles and other vegetation that have a smothering and competing effect on the longleaf pine seedlings. Prescribed burning releases the seedlings, whereas, without it, they might remain in the grass stage and fail to make height growth for up to 12 years. Other benefits include reduction of rough, improvement of wildlife habitat and livestock forage, and control of undesirable vegetation or unwanted hardwoods.
   Procedures: Burn should be done during winter months when longleaf pine buds are dormant and within 1 to 2 days following a rain of 1 to 2 inches when air temperatures fall to 40 degrees Fahrenheit or below, relative humidity is 30 to 60 percent, and winds are northerly, 3 to 10 miles per hour and steady. A strip headfire or running headfire should be used. The object is to get a fast-moving fire that will scorch infected needles without injuring terminal buds of seedlings. Large areas, preferably 200 acres or more, should be burned to discourage reinfection from the unburned areas. the burn should be repeated 2 years later if most of the seedlings still have not started height growth and one-third or more of the needles again have brown-spot. The same precautionary measures as for mature pine should be taken. Burning areas in which over 60 percent of the seedlings have begun to make height growth and terminal buds are 4 to 12 inches above the ground should be avoided. The terminal buds of such seedlings are usually killed since they are at levels where the fires are the hottest. In such cases, the prescribed burn should be delayed until seedlings have grown above 12 inches and are no longer subject to lethal temperatures. The number of seedlings lost to brown-spot needle blight will be less than those killed by a poorly timed strip headfire or running headfire.

6. Pine stand, usually planted and occasionally natural, age 10 to 30 years, usually loblolly pine and less commonly shortleaf, longleaf, and slash pines, growing on old fields with sandy soils and soils low in organic matter, where thinning or some other form of cutting has been done, and trees are susceptible to root rot caused by the fungus, Fomes annosus.
   Objectives: To destroy the causal fungus and prevent spread of root rot. Other benefits include fuel reduction, improvement of wildlife habitat and livestock forage, and control of unwanted hardwoods.
   Procedures: The same burning technique as specified for young pine stands should be used. Follow-up prescribed burns should be scheduled if infections by Fomes annosus, as evidenced by appearance of fruiting bodies on stumps of cut trees and at bases of standing trees, recur following thinning and other cutting operations. Even though new infections are not widespread, the follow-up burns will reduce the rough and result in other benefits. The same precautionary measures as for mature pine should be taken.

7. Pine, shrub, grass type, with loblolly, shortleaf, longleaf and slash pine species the dominant vegetation; may be planted or of natural origin, of variable age and density, and usually of poletimber and sawtimber sizes, with associated shrub, grass and forb components suitable for browsing and grazing by deer and cattle.
   Objectives: To burn accumulated rough (cured grasses, dried leaves and pine needles); to reduce the smothering effect of cured vegetation and encourage early "green-up" of forage plants, improve succulence and palatability of grasses, herbs and shrubs; to increase protein, phosphorus and calcium content of the new growth and overall yield and quality of herbage, legumes and browse. Prescribed burning improves wildlife habitat for deer, turkey, quail, and rabbit. Other benefits include control of unwanted hardwoods and brush, control of brown-spot needle blight on longleaf seedlings, and exposure of mineral soil for the germination of seed and establishment of forage.
   Procedures: A winter backfire should be used to reduce initial fuel mass. The burn should be done under the same conditions specified for mature pine. On large ownerships (500 acres or more), the burn should be done in a checkerboard pattern and on a 3- to 4-year rotational basis, burning one block of equal size each year. The same precautionary measures as for mature pine should be taken.

Prescribed Burning on Other Vegetative Types:

1. Recreation areas, vistas, facilities having aesthetic and biological values, and nature study areas.
   Objectives: To enhance appearance, maintain open spaces and increase numbers and visibility of flowering plants, stimulate succession in plant communities and create diversity of vegetative types for wildlife.
   Procedures: Winter backfire should be applied as for young pine stands above. The same precautionary measures should be taken as for mature pine stands. Burning should be avoided when areas are being used by visitors. Careful preplanning and contacts with persons in charge of the area are required.

2. Forested areas requiring improved access
   Objectives. To reduce understory and increase visibility for proper location of access roads and firebreaks; to facilitate aerial and ground application of fertilizers and herbicides; to control unwanted hardwoods; to prepare sites for tree planting, direct seeding or natural seeding; and to facilitate timber marking and cutting.
   Procedures. Winter backfire should be applied under conditions prescribed for mature pine and the same precautionary measures taken. Selective timber marking should be delayed until after 3 to 5 heavy rains have fallen to reduce the amount of "smut" on trees and brush.

3. Grassland
   Objectives. To improve forage quality and quantity by reducing mature vegetation cover and to aid in distribution of grazing. Also, to reduce the smothering effect of cured vegetation in nongrazed areas.
   Procedures. A spring burn immediately prior to or during initial green-up of species being managed. These burns will be planned and supervised by the MFC. The same precautionary measures should be taken as for mature pine.

SPECIFICATION SHEET FOR
PRESCRIBED BURNING

SITE SPECIFIC COMMENTS AND RECOMMENDATIONS:

1. Name of landowner(s) -

2. Location of prescribed burn management area (section, township, range, other description) -

3. Desired wildlife species/habitat -

4. Present habitat/cover -

5. Purpose of burn -

6. Recommended type, size, timing, and frequency of burn -

7. A burning plan will be prepared by -

Note: A site-specific burning plan must be prepared prior to carrying out a prescribed burn. Also, the date of the plan must be documented by having the plan notarized prior to the burn. On the day the burn is done, a burning permit must be obtained from the Mississippi Forestry Commission. The following information must be recorded on the burn plan: 1) burning permit number and 2) time of day the permit is in effect as determined by Stagnation Index reading.