

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

PRESCRIBED BURNING

(Ac.)

CODE 338

DEFINITION

Controlled fire applied to a predetermined area.

PURPOSE

- 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

This practice applies on all lands as appropriate.

CRITERIA

General Criteria Applicable to All Purposes

- All prescribed burns shall address the following items:
- Location and description of the burn area.
- Pre-burn vegetation cover.
- Resource management objectives.
- Required weather conditions for prescribed burn.

- Notification check list.
- Pre-burn preparation.
- Equipment checklist/personnel assignments and needs/safety requirements.
- Post burn evaluation criteria.
- Firing sequence.
- Ignition method.
- Approval signatures.

Procedures, equipment, and the number of trained personnel shall be adequate to accomplish the intended purposes.

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

Time burn to minimize soil erosion and burn effects on soil properties (structure, soil moisture).

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.

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

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

An open burning permit must be obtained from the NC Division of Forest Resources prior to conducting the burn.

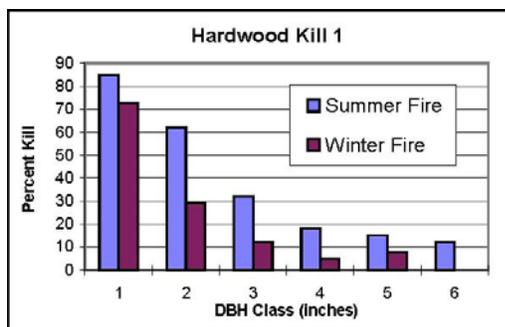
Comply with applicable federal, state and local laws, regulations and guidelines during

implementation of this practice (including North Carolina Prescribed Burning Act requirements and North Carolina Smoke Management Guidelines).

Additional Criteria To Control Undesirable Vegetation

Time prescribed burn when target plant vegetation carbohydrate reserves are low. Generally, hot, growing season burns will have the greatest impacts. Often a properly timed combination of herbicide treatment or cut/slash and burning can give more complete control. Fire will sometimes not give complete control but can reduce seed stocks of undesired species.

For Pine Forest Land - Unwanted hardwood encroachment in pine stands is best controlled with growing season burns when hardwoods are small in diameter. The chart below shows the effects of prescribed burning on undesirable hardwoods by diameter class and burn season.



Winter burns result in less pine root kill than spring and summer burns, but hardwood resprouting can occur. Resprouts can be controlled by repeated burns over several consecutive years while diameters are small. Good hardwood control occurs when burns are done during the growing season; however, in many cases hardwood control is only achieved when done in combination with herbicide application.

Additional Criteria to Prepare Sites for Harvesting, Planting or Seeding

Burning is regularly prescribed for forest harvest, planting and natural regeneration.

For Preparing to Harvest - High-moisture burns should be used prior to harvest to prevent destruction of organic duff, conserve moisture, and prevent erosion. High-moisture burns may be conducted 2 to 3 days after summer showers.

(Refer to NC Practice Standard NC666 – Forest Stand Improvement).

For Natural Regeneration - 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. *Longleaf* pine should be burned in the spring of the year in which seeding is expected. *Loblolly* does not need litter cover; so burning just prior to seed fall is satisfactory. (Refer to NC Practice Standard NC612 – Tree & Shrub Planting).

For Site Preparation and Planting - A hot fire is usually required to kill unwanted woody competition prior to planting. Burn in late summer or fall to reduce understory competition and woody debris for tree planting. (Refer to NC Practice Standard NC490 – Tree & Shrub Site Preparation).

Additional Criteria to Control Plant Disease

Prescribed burning reduces and alters the microenvironment or the litter layer which can help control some plant diseases. Follow accepted guidelines for control of the target plant disease. Some applicable examples for North Carolina are listed below.

Brownspot Disease in Longleaf Pine - Apply prescribed burn 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. *Brownspot* can be controlled with dormant season burns (December - February). Seedlings should be in the “grass” stage; additional burns may be needed if re-infection occurs.

Fomes annosus root rot - Prescribed burning to reduce litter (dormant season) seems to reduce problems from this fungal disease. It is thought that prescribed fire can destroy fungal fruiting bodies and cauterize host tree stumps.

White Pine Cone Beetle - Prescribed fire can be used under 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.

Additional Criteria to Reduce Wildfire Hazards

A systematic application of prescribed or ‘hazard reduction’ burns can reduce fuel loads in

forestland and reduce the risk of wildfire, particularly in southern pine stands.

The intensity of a hazard reduction burn must be carefully designed and executed based on fuel type, tree species characteristics for a specific site, along with weather conditions and live fuel moisture (particularly waxy plants such as in wax myrtle, gallberry, etc). Hazard reduction burns should not significantly damage existing trees but should remove enough fuel to provide an appropriate level of wildfire protection. Where very heavy fuels or understory exist, mechanical treatment may be required before a hazard can be maintained with burns.

The interval between hazard reduction burns varies based on fuel accumulation, past fire exposure, value of resource protected, and risk of fire. For pine stands this is usually every 3-4 years. Fuel reduction of 75-80 percent of the area is sufficient.

Additional Criteria to Improve Wildlife Habitat

Burn prescriptions should recognize the biological requirements (life cycle, nesting times, etc.) of the preferred wildlife species and their associated habitats.

Frequency of burning varies depending on the target wildlife species, but usually is every 2 years for quail and songbirds, and 3-5 years for deer and turkey. Rotate burns based on the burn frequency to maintain consistent habitat availability.

For deer, turkey and quail, strips or blocks within the burned area can be left unburned to increase the "edge" effect and available escape cover.

Additional Criteria to Improve Plant Production Quantity and/or Quality

Prescribed burning improves browse in open pine and oak stands. 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. Plant species composition may change over time depending on the fire tolerance of the species.

Additional Criteria to Remove Slash and Debris

Broadcast burning slash and debris is preferable to piling and burning.

If debris must be piled or windrowed, construct round piles when ground and debris are fairly dry to restrict the amount of dirt in the piles.

Protect surrounding trees from fire and scorching.

Additional Criteria to Enhance Seed and Seedling Production

Prescribed burning can enhance seed and seedling production in some plants. Season, intensity of fire, and other burn specifications must be specifically formulated for the target plant species.

Additional Criteria to Facilitate Distribution of Grazing and Browsing Animals

Low intensity burns can increase the quality and quantity of grasses and forbs. Generally, native plants will respond best to burning. Time burning based on the target grass/forb life cycle for best response.

Cattle and other domestic animals will congregate to graze recently burned new growth. Plan burning to distribute animal herd and prevent overgrazing. Prescribed burning for grazing should be implemented in conjunction with a prescribed grazing plan (refer to NC Practice Standard NC528 – Prescribed Grazing).

Additional Criteria to Restore and Maintain Ecological Sites

Some plant/animal communities depend on fire for establishment and long term viability. To restore or maintain these communities, specific characteristics of the target species or community of species must be understood, along with historical understanding of fire in the geographic area being managed. Prescribed burning should be planned and applied at an intensity, interval and season appropriate for the targeted ecological site.

Examples of fire dependent communities in North Carolina include: Longleaf/wiregrass, Longleaf/shrub oak woodlands, canebrakes and oak woodland savannas.

Prescribed burning to restore plant communities should be implemented with a restoration plan (refer to NC Practice Standard NC643 – Restoration and Management of Rare and Declining Habitats).

CONSIDERATIONS

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

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

Take care when re-introducing fire into mature forest stands that have had fire excluded for a number of years. Mature trees tend to utilize duff layers for nutrient uptake. Re-introduction of fire can damage and/or kill trees if feeder roots are extensively damaged or if trees are girdled by fire as a result of smoldering duff at their base.

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

Notify adjoining landowners, local fire departments and public safety officials as appropriate within the area prior to burning.

Burn Season Considerations:

- 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.
- d. Fall - Pines are more likely to die if scorched or roots are damaged at this time. Fall is a good time for site preparation burning prior to tree planting.

This practice has the potential to affect National Register listed, or eligible, significant cultural resources (Cultural Resources Information - NC, FOTG Section II). Follow NRCS state policy for considering cultural resources during planning and design.

PLANS AND SPECIFICATIONS

North Carolina Class I Job Approval for 338-Prescribed Burn is required to address prescribed burning in a conservation plan (see North Carolina supplement to General Manual 190-Part 413).

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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 and the burn plan, or other acceptable documentation.

All necessary permits must be obtained and a burning plan developed before implementation of the practice.

Minimum documentation for this practice includes (as applicable):

- Map showing location of area to be burned; additionally, the map should delineate:
 - Existing natural or constructed barriers to fire such as streams, water bodies, roads, etc.
 - Sensitive areas such as critical areas, cultural resources, wetlands, natural areas, etc. that need to be considered during prescribed burn.
- Vegetation 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.

As a minimum, the prescribed burning plan will include/address the following:

- 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 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. Aids to Determining Fuel Models For Estimating Fire Behavior, General Technical Report INT-122, National Wildfire Coordinating Group, 1982.
3. Burning in the Growing Season, E-1025, Oklahoma Cooperative Extension Service, E-1025.
4. North Carolina Forestry Best Management Practices Manual, amended 2006, NC Forest Service Publication number FM-08-01
5. N. C. General Statute