

Fire Management

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REMEMBER:

Guidelines help with *how* to manage,
not *whether* to manage.

These guidelines focus on *how* to protect the functions and values of forest resources during forest management activities. They do not provide advice on *whether* to manage or which management activities are needed.

Guidelines provide a *menu*, not a *mandate*.

Site-level resource management decisions are based on many different factors, including resource needs, landowner objectives, site capabilities, existing regulations, economics and the best information available at any given time. No one will apply all of the guidelines related to a particular activity. Instead, the landowner, resource manager or logger will consider many different factors in determining which combination of guidelines provides the best “fit” for a particular site at a particular time. The intent of having multiple guidelines is to provide decision-makers with as much flexibility—and as much choice—as possible in taking steps to effectively balance forest management needs and resource sustainability.

General guidelines and *activity-specific* guidelines
are closely related.

Frequent references from activity-specific guidelines back to the general guidelines will make it easy for landowners, resource managers, loggers and others to consider all of the related guidelines—both general and specific—that apply to a particular management activity.

Guidelines are supplemented from time to time
by “Additional Considerations.”

The guidelines are supplemented from time to time by “Additional Considerations,” which provide additional guidance to further promote sustainability of our forest resources.

INTRODUCTION

The term fire management includes both prescribed burning and fire suppression:

- Prescribed burning is the intentional application of fire to wildland fuels (in either their natural or modified state) under specified environmental conditions.
- Wildfire suppression is the effort to control, contain or extinguish wildfires in order to protect life, property and resources.

The Benefits of Guidelines

Benefits to cultural resources: Fire management guidelines can help protect surface features of archaeological sites, cemeteries, historic buildings and structures from the adverse effects of fire. Guidelines for construction of fire breaks and movement of heavy equipment can minimize direct or indirect disruption of soils, rutting, compaction and erosion that can damage cultural resources.

Benefits to forest soils: Fire management guidelines address concerns related to those soils in Minnesota that are particularly sensitive to the effects of fire—especially intensive slash burns where fuels are close to the ground. Fire management guidelines can help minimize the potential for these slash burns to reduce soil productivity.

Benefits to riparian areas: Fire management guidelines can minimize alteration of vegetation within the riparian area. That vegetation is important for providing inputs of coarse woody debris and fine litter to water bodies; retaining nutrients, sediment and energy; bank and shoreline stabilization; maintaining moderate water temperatures through shading; and wildlife habitat. Guidelines for retaining vegetation can also have a positive impact on aesthetics, wood products and recreation.

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Benefits to water quality and wetlands: Fire management guidelines address concerns related to the exposure of mineral soil from the burning of organic matter and from fuelbreak construction, the release of plant nutrients following burning, and increased post-burn surface temperatures, which can increase nonpoint source pollution. Guidelines that address equipment operations and maintenance can help protect water quality and wetlands. Properly applied guidelines also help ensure maximum benefits of fire to wetland ecosystems.

Benefits to wildlife habitat: Fire management guidelines address the potential for both wildfires and prescribed burns to eliminate important structural habitat components on a site, such as snags and coarse woody debris. Guidelines can minimize the potential adverse effects of fire on unprotected sensitive sites, unique habitats and rare species.

Considerations

- Safety and the protection of life and property are the priority in fire management.
- Other fire management considerations should include protection of cultural resources, forest soils, riparian areas, water quality and wetlands, and wildlife habitat.
- Making fire management personnel aware of cultural resources, through training and advance planning, can help protect cultural resources.
- Slash burning, where fuels are close to the ground, can in some cases reduce soil productivity by consuming the forest floor and superheating the surface of some soils (particularly dry sandy soils). This results in reduced water-holding capacity, volatilization of some nutrients, and allowing other nutrients to become rapidly available for plant uptake, runoff or leaching.
- Because pulp and paper industries cannot accept charred wood, merchantability may be negatively affected by burning in standing timber.



Have you identified
your goals and objectives?

See *Identifying Goals and Objectives*
in General Guidelines.

Have you conducted a site inventory?

See *Conducting a Site Inventory*
in General Guidelines.

PLANNING

IMPORTANT! Review General Guidelines:

- Incorporating Sustainability into Forest Management Plans
- Maintaining Filter Strips
- Managing Riparian Areas

Burn Plan Development

U Consult with local DNR offices for technical advice and assistance in prescribed burning. See *Resource Directory*.

U Obtain a DNR permit prior to burning as required under Minn. Statute, Chapter 88.17. See *Resource Directory*.

U When planning burns in or near wetland areas and seeps, avoid damaging the hydrology on sites during management operations.

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U Plan prescribed burns to increase success of oak regeneration where applicable.

U Consult with the Office of the State Archaeologist and the Minnesota Indian Affairs Council if there are burial sites within prescribed burn areas. For sources of information and assistance, see *Resource Directory*.

U Include cultural resource information in both wildfire suppression and prescribed burn plans. Important information includes:

- Locations of known cultural resources
- Locations of high probability areas for the occurrence of cultural resources
- List of professional cultural resource managers and tribal representatives who can be contacted for assistance. For sources of information and assistance, see *Resource Directory*.

U Minimize impacts of fuel break construction by applying one or more of the following guidelines:

- Consider such alternatives as herbicide use, mowing or other non-erosion-causing practices for fuel break maintenance on areas where prescribed fire will be used on a recurring basis.
- Use natural or in-place fuel breaks (such as roads, streams, lakes and wetlands) where appropriate, as an acceptable way to minimize the need for artificial fuel break construction.
- Consider the use of fire retardant in place of plowed fuel breaks where fuel break construction would result in unacceptable soil erosion, water quality degradation or damage to cultural resources.
- When artificial fuel breaks must be used, place fuel breaks, fueling and maintenance areas outside of filter strips or the RMZ, whichever is wider, whenever practical. See *General Guidelines: Maintaining Filter Strips* and *General Guidelines: Managing Riparian Areas*.
- Locate fuel breaks on the contour whenever possible, and avoid straight uphill-downhill placement.



The goal of this prescribed burn is to underburn pine for regeneration. *Photo courtesy of Minnesota DNR*

U When conducting prescribed burns, use low- or moderate-burning intensity so that the minimum amount of forest floor is consumed consistent with meeting the objectives of the burn, especially for dry sandy soils or shallow soils over bedrock.

U Avoid placement of piles for burning within filter strips or drainage channels adjacent to streams, lakes and wetlands.

Additional Consideration

K Consider maintaining the diversity of mast sources on the site, as well as some level of current production of mast sources. For example, establish fuel breaks around key pockets of mast-producing shrubs along the edges of prescribed burn sites.

OPERATIONAL ACTIVITIES

IMPORTANT! Review General Guidelines:

- Protecting Cultural Resources
- Managing Equipment, Fuel and Lubricants
- Protecting the Normal Flow of Streams and Wetlands
- Protecting Wetland Inclusions and Seasonal Ponds
- Retaining Leave Trees
- Providing Coarse Woody Debris

U Conduct on-site meetings with the contractor, landowner and resource manager prior to moving equipment onto a site. Such meetings can help assure common understanding of landowner objectives, contract specifications and site conditions.

Pre-Ignition Activities

U Delineate cultural resource areas and carefully consider the effects of prescribed burns on them.

U Pre-position fire-fighting personnel and equipment at cultural resources that are susceptible to damage by fire.

U If cultural resources cannot be avoided within prescribed burn areas:

- Treat above-ground features with fire retardant.
- Protect below-ground archaeological sites from compaction and rutting.

U Protect the largest coarse woody debris from prescribed burning.

U Control the pattern and timing of burn ignition by evaluating existing or developing conditions on the ground.

Managing Fuel Breaks and Accesses

U Construct fuel breaks outside of cultural resource areas. Use cultural resource professionals or tribal representatives to help determine fuel break location. For sources of information and assistance, see *Resource Directory*.

U Construct fuel breaks only deep enough and wide enough to control the spread of the fire.

U Avoid construction of fuel breaks for fire management that result in drainage directly into a water body.

U Provide adequate filter strips when constructing fuel breaks that expose bare soil near wetlands.

U Use fuel break construction methods in wetlands that do not expose bare soil whenever practical. These may include wet lines, existing constructed or natural barriers, foam or retardants. If techniques result in exposure of bare soil, such areas must be restored if wetland hydrologic functions are impacted.

U Maintain erosion control measures as needed on fuel breaks. For sources of seeding and fertilizing recommendations, see *Resource Directory*. Refer also to water bar construction and spacing specifications in *Forest Road Construction and Maintenance: Drainage*.

U Employ suitable water diversion structures on fuel breaks, approaches to water crossings, or on roads and trails found within the riparian management zone to divert water off of the right-of-way before it reaches the water body.

U Monitor the effectiveness of cultural resource management practices during prescribed burns and wildfire suppression activities.

U Control access to sensitive cultural resources.

Protecting Water Quality and Wetlands

U Establish unburned zones containing no fuel breaks to protect water quality in situations where steep slopes, highly erodible soils, or the likelihood of substantial organic matter removal are present. See *General Guidelines: Maintaining Filter Strips* and *General Guidelines: Managing Riparian Areas*.

U When working with foam or retardants near lakes, streams or wetlands:

- Follow manufacturer recommendations.
- Prevent or minimize runoff of fire-retardant chemicals into water by keeping filter strip areas off-limits to retardant use.
- Avoid cleaning fire-retardant application equipment in lakes or streams.

POST-OPERATIONAL ACTIVITIES

IMPORTANT! Review General Guidelines:

- Post-Operational Activities and Followup Visits

U Stabilize erodible soils through such techniques as seeding, mulching and water bars. For sources of seeding and fertilizing recommendations, see *Resource Directory*. Refer also to recommended water bar construction and spacing specifications in *Forest Road Construction and Maintenance: Drainage*.

U Assess the condition of cultural resources that may have been affected by prescribed burning or wildfire suppression activities.

U Field inspect the burned area to identify cultural resources that may not have been previously identified but have been newly exposed by the fire.

U Remove temporary fire management features that are inappropriate to the historic character of adjacent cultural resources.

U Restore water source sites used for fire management activities as soon as practical following control, or at the completion of mop-up activities.

