

NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD

PRESCRIBED BURNING  
(Acre)  
CODE 338

DEFINITION

Applying controlled fire to a predetermined area.

PURPOSES

- To control undesirable vegetation including woody plant invasion.
- To prepare sites for planting or seeding.
- To control plant disease and insects.
- To reduce wildfire hazards.
- To improve wildlife habitat.
- To improve forage production quantity and/or quality.
- To remove slash and debris.
- To enhance seed and seedling production.
- To facilitate distribution of grazing and browsing animals.
- To restore native plant communities.

CONDITIONS WHERE PRACTICE APPLIES

On all land uses.

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. Only NRCS staff with proper job approval authority may assist in developing or reviewing a burn plan. NRCS staff will not under any circumstances assist in conducting the burn. See Appendix A of the NRCS-National Range and Pasture Handbook for national and state prescribed burning policy.

- Landowner cooperators will be cautioned to burn in accordance with applicable federal, state, and local laws and regulations. They must understand that they may be liable for damages caused by fire escaping from their land or for damage caused to others from inadequate smoke management. They may also be responsible for fire suppression cost, should the fire escape the designated area.
- Liability and safety precautions are to be planned before the burn and monitored during the burn.
- Comply with applicable federal, state, and local laws and regulations, including the state's Best Management Practices and Clean Air Act.
- 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).

Kinds of Fires

There are three basic kinds of prescribed fires. The selection of a burning pattern will be done by individuals properly trained and experienced in prescribed burning. The specific burn pattern will be based on the burn objective and site specific conditions.

1. **Backing Fires.** Back fires are the hottest type of burn, and burn into the wind. Fire is started along a prepared firebreak, and allowed to burn into the wind. Back fires work best with wind velocities of 4-12 MPH from a constant direction. Burning downward on slopes has an effect similar to backfires.
2. **Head Fires.** Head fires burn with the wind. They have greater flame lengths, faster rates of spread, greater smoke

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Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact the MN Natural Resources Conservation Service in your area or download it from the electronic Field Office Technical Guide for Minnesota.

volumes and burn cooler than backing or flank fires.

Always burn a strip downwind with a backfire wide enough to control the head fire.

3. **Flank Fire.** Flank fires burn at oblique angles to the wind direction. Flank fires are often used to secure the flanks of a head fire as the head fire progresses. This method requires expert crew coordination and timing.

#### Containing Fire

Refer to practice standard Firebreak (394).

#### General Burning Prescriptions

Conduct a test burn on the down wind side of the planned burn area and within the protection of an established firebreak. Use the test burn to confirm that the fire will burn as predicted, the burn will achieve the planned objective, and the smoke can be managed as planned. Defer the burn if the test burn is not satisfactory or if prolonged drought has caused high fire danger levels. Burn only within the prescription set forth in the prescribed burn plan.

For additional specific criteria to improve wildlife habitat and restore and manage oak savanna communities refer to practice standards Early Successional Habitat Development/Management (647) and Restoration and Management of Declining Habitats (643).

#### • TIMING TO ENHANCE OR CONTROL

1. **Native warm season species:**  
Burn in late spring, about May 1 in southern Minnesota and May 15 in the northern part of the state.
2. **Native cool season species:**  
Best responses are obtained with very early spring (March - April) or late summer (August-September) burns.
3. **Mixture of exotic cool-season grasses and legumes:**  
Best response with burns during March to June; least response by legumes in late summer-early fall burns.

4. **Woody Vegetation (brush and small trees):**

Late summer or early fall (August-September) burns are most effective in controlling woody vegetation. Spring burns (May-June) generally induce shrubs and brush to sprout, but frequent fires may reduce frequency of woody plant cover. Usually, conditions will not be dry enough to burn until after a frost in late September or early October. Additional chemical treatment may be necessary for complete control.

Frequency of burning should be based on regrowth of targeted species and weighed against forage and/or wildlife habitat considerations.

#### • WEATHER CONDITIONS

Ideal burning conditions:

1. Temperature:	70-90 degrees F
2. Relative Humidity:	25 to 50 percent
3. Wind:	Steady winds between 5-18 MPH
4. Moisture:	5-11 percent
5. Time:	10 a.m. to 4 p.m.

#### • SMOKE MANAGEMENT

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

Critical considerations for smoke management include:

1. A 360 degree check for possible restrictive air space.
2. A 360 degree check for sensitive areas such as residences, roads, airports.
3. A check of sensitive areas downwind and 45 degrees either side of initial wind direction.
4. An estimate of the length of time necessary to conduct the burn, plus a margin of error for wind shift or loss of speed, to predict smoke duration.

5. Electrical or high power transmission lines will be documented and the burn plan designed and applied so that high dense smoke columns will not cross under or contact these lines. Electrical discharge can occur due to high concentrations of carbon in smoke columns.

**General considerations for smoke management:**

1. Moist fuels produce more smoke than dry fuels.
2. Head fires produce more smoke than slower burning backing fires.
3. Smoke problems at night are more hazardous than during daylight.
4. Stable air mass conditions can cause air inversions, which restrict smoke convection. Unstable atmospheric conditions are usually better for smoke management.

- **GRAZING PROCEDURE**

1. Frequency of burning will be based on extent and duration of grazing responses, but should generally not be more than once every three years.
2. Prior to burning, defer grazing in area to be burned for one full grazing season so that sufficient residue is present to carry a fire.
3. After burning, defer grazing until managed grasses have 6-8 inches of new growth.

**CONSIDERATIONS**

- **Prescribed burning** is generally not meant to be an annual management practice. Burn only to meet a specific management objective. (See Purposes).
- Clients without experience in burning should be advised to seek assistance from persons who have adequate training or experience in applying this practice, such as the Department of Natural Resources, US Fish and Wildlife Service, The Nature Conservancy, rural fire departments and private consultants.

**NRCS staff will not assist in burn application.**

- Burning should be managed with consideration for wildlife needs including threatened and endangered species.
- Existing barriers such as lakes, streams, wetlands, roads, and constructed firebreaks are important to the design and layout of this practice.
- Adjoining landowners within the air shed should be notified prior to burning.
- Local fire departments and public safety officials should be notified prior to burning.
- Consider cultural resources when planning this practice. This practice may adversely affect cultural resources and should comply with GM 420, Part 401 during planning, prior to installation and during maintenance.
- Weather parameters and other data that affects 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 overhead electric power lines, natural gas pipelines and power/telephone poles. Power poles and railroad ties contain creosote and burn readily.

**PLANS AND SPECIFICATIONS**

**A written burn plan will be prepared by properly trained individuals.** Specifications must adhere to all applicable NRCS policies in the General Manual and the National Range and Pasture Handbook, as well as all applicable state and local laws, ordinances, and regulations. The landowner or land operator will obtain necessary approval, permits and variances prior to conducting the prescribed burn.

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.

Refer to the NRCS-National Range and Pasture Handbook for sample burn plans. **Required** items of a burn plan shall include, but are not limited to:

- Location of the burn.
- Resource management objectives of the burn.
- Necessary approvals, permits and variances.
- Pre-burn vegetative description of the area.
- Prescription for weather conditions required and observed conditions.
- Description of the burning method to be used.
- Description of pre-burn preparation.
- Firing sequence of area to be burned.
- Smoke management considerations.
- Contingency plan for fire escapes.
- Communication plan.
- Job assignments and descriptions of responsibilities for all persons assisting with the burn.
- Equipment and materials checklist (ex. drip torches, tractors, discs, pump trailers etc.).
- Job assignments and descriptions of responsibilities for all persons assisting with fire patrol, containment, mop-up, and suppression of the burn.
- Post-burn evaluation and management.
- Burn boss or landowner signature acknowledging acceptance of full liability resulting from implementation of the burn plan.

#### OPERATION AND MAINTENANCE

To achieve benefits of the prescribed burn, other practices in a Conservation Management System need to be carried out as planned.

#### REFERENCES

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