

# Why Prescribed Fire?

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## Background

Prairie and forest fires are a natural occurrence and are essential to the maintenance of the ecosystem. Most prairie and forest ecosystems in the Northern Great Plains would not exist without fire.

Though these areas are among the most diverse ecosystems in North America, the extent of their diversity is not always visible to the casual observer. Threatened and endangered insects, including numerous moth and butterfly species, inhabit these areas and depend on the ecosystem's ecological makeup for survival. Prairies are frequently found in association with wetlands. The wetlands could include sensitive or endangered bogs or fens for which fire is important.

Management-ignited prescribed fires prevent unnatural vegetation from competing with rare plants and prevent the area from changing into a dense forest. Fire also encourages microbial activity, the activity of microscopic organisms that are responsible for the decay of dead

materials. This activity increases the level of soil nutrients that plants require for growth. In addition, fire stimulates the germination of many prairie plant seeds.

Often, instead of seeing a prairie, some people see fields that have little value. The more we know about prairies and the value of ecosystems, the more we will be able to help future generations to: 1) know how to identify and protect these fragile areas and 2) understand that fire is one technique used by natural resource managers to protect and foster prairie growth.

Whether natural or human-caused, fires are an important force in the Black Hills forested areas. Prior to settlement of the area, fires started by lightning or by Indians to drive game, burned under natural conditions. Many sections of the forest burned quite regularly, every 12 to 16 years in the lower Black Hills, and every 20 to 40 years in the higher elevations. Thus only thin layers of combustible material could accumulate on the ground. Most of the fires burned "cool", consuming only the ground layer, although some jumped into tree crowns and trunks killing the cambium (growing layer) under the outside bark. Ground fires frequently eliminated mats of pine seedlings under large overstory trees and prevented excessively thick stands of unhealthy trees from developing. Much of the forest was kept open and park-like. Humans have inadvertently created in many areas conditions favoring devastating crown fires as well as overpopulation of trees.

*(Portions of the previous paragraph are adapted from "Yellow Ore, Yellow Hair, Yellow Pine" by Donald R. Progulsk, a book that documents the 1874 expedition of General George A. Custer.)*

## Ingredients for a Prescribed Fire

A prescribed fire is a calculated and carefully planned event. Fire managers construct a fire plan that considers elements such as wind conditions, weather, season, humidity, the amount of moisture in the dead vegetation, and the quantity and availability of fuel (natural build up of leaf litter and woody growth). As part of the plan, fire managers determine how hot the fire will burn and in what direction it will travel. Using that information, managers carefully station each member of the fire crew so that the fire site is well managed and the crew is safe. A fire plan includes precautions to prevent the fire from becoming an uncontrolled wildfire. In addition, a fire plan specifies emergency procedures to handle an uncontrolled fire, should it become necessary. At a meeting prior to the prescribed burn, the fire manager outlines the details of the fire plan so that all crew members know their role in this concerted effort. Before the burn begins, all supplies are inventoried and checked for proper operation.

## Prescribed Burn

In the preparation of the fire plan, managers carefully study the site to minimize the risk of fire escaping from the burn unit. One way managers decrease the risk is by constructing a barrier, or firebreak, around the prescribed burn site. Natural firebreaks, such as roads, ditches, water or other physical features devoid of natural fuel are the best barriers. Frequently, however, a firebreak must be built ahead of time to remove materials that would fuel a wildfire. Mowing, using a leaf-blower to remove fuel, and wetting down the area with fire hoses are methods used to prevent fire from burning outside the prescribed area.

On the day of the prescribed burn, the fire crew considers all environmental elements, the most important being moisture in the vegetation and wind speed and direction. Wind determines

where the fire will be ignited and in which direction it will burn; the fire plan specifies which wind direction is required. If conditions are not appropriate, the burn is delayed.

Fire crews light the prescribed fire with a drip torch (a can of fuel with a flame-carrying wick at the spout). When the drip torch is tilted, fuel squirts through the top and creates a stream of flames that lands where the torch is pointed.

The fire manager or crew leader usually determines where the fire should be placed and directs the operation of the person carrying the drip torch. Most of the fire crew members concentrate on containing the fire within the previously constructed firebreaks. Crews use fire hoses, flappers, and backpack pumps filled with water to control the edges of the fire at the firebreaks. Nearby fire engines and water tenders (tankers) can be mobilized if they are needed.

After fire crews complete the burn and extinguish smoldering remains, the site looks charred and lifeless. However in less than three days the basal (base) leaves of prairie plants such as little bluestem, buffalo grass, black root sedge, needle and thread grass, and prairie sand reed appear under the charred remains. In contrast, invaders or unwanted species such as smooth brome, cheat grass, and Kentucky bluegrass do not make such a successful resurgence after a fire.

## Effects on Animals

Since a prescribed fire moves at only 0.1 to 1.6 mile per hour, most animals can move out of it's way if needed. Few animals are nesting or caring for young in February, March, April, September, October and early November, the times when prescribed fires are most likely to occur. Most small birds do not arrive in the Northern Great Plains area until around the first of May. Burrowing animals, who by instinct will seek refuge underground, find safety since high temperatures from a prescribed fire only penetrate one to two inches into the soil.

## Time of Year

In the Northern Great Plains area, prescribed burns and wildfires usually occur in late winter, spring, late summer, or fall. In the winter, due to the ice and snow, the moisture content in the vegetation is too high and the temperatures are too low. After "green-up" in early May, the grasses and other herbaceous plants sprout. These live plants have a very high moisture content and inhibit the spread of fire, making prescribed fires in the spring and early summer difficult or impossible. If late summer brings hot, dry weather, prescribed fires could be possible in prairie areas in August and September. Fall burns can be done after the grasses are frost-killed and dried. This fall "window" usually begins in late September or early October and lasts 2-8 weeks until the onset of winter precludes any fires until the weather warms up again in the late winter or early spring.

## Wildfires

Wildfires will eventually burn most areas, with fires caused by lightning, an arsonist, or an escaped campfire. If the area has not burned in many years, the unnatural accumulation of thick, sometimes dead vegetation, can result in a very intense, fast-moving conflagration. However, if the area has been treated recently with a prescribed fire to remove excess fuel, the wildfire will be much easier to control and homes will be less threatened.