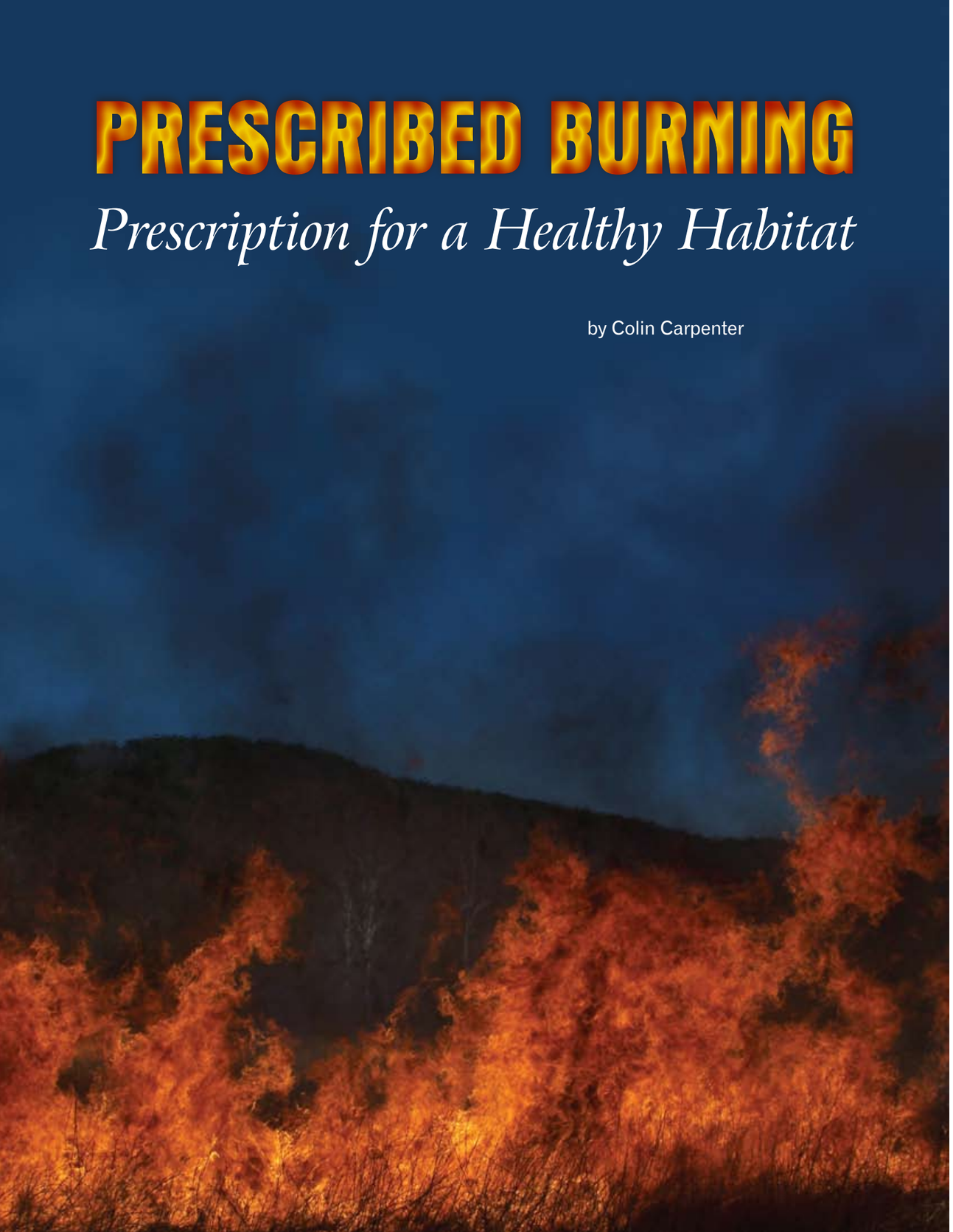
PRESCRIBED BURNING

Prescription for a Healthy Habitat

by Colin Carpenter



Since 1944 the iconic character Smokey Bear has warned us of the dangers of wildfires. Wildfires (often called "brush fires") are any unwanted, unplanned or uncontrolled outdoor fires. Smokey's message concerning wildfires is a good one. Throughout the United States, wildfires destroy homes, property and timber as well as take lives. However, fire can be a cost-effective wildlife management tool when properly planned and carefully executed.

Early settlers found Native Americans using fire to provide better access to the forest, improve hunting, and remove brush to allow farming. In the southern Appalachian region, large savannahs and grasslands occurred over much larger areas than they do today. Settlers used fire in much the same way as the Native Americans, and often built homes and communities in areas that had already been cleared by fire. However, the destructive wildfires that occurred following widespread logging at the beginning of the 20th century left millions of acres devoid of trees. The wildfire problem following logging, as well as the need to provide forests with a fire-free interval to allow the reestablishment of trees, led many foresters to advocate total exclusion of fire from the woods.

As knowledge concerning the effects of fire on ecosystems has accumulated, the attitudes of many resource managers have changed. In fact, fire is essential to the maintenance and perpetuation of many plant communities. Wildlife managers and foresters manipulate the timing and intensity of fires to achieve desired management objectives. These fires are called prescribed fires, prescribed burns or controlled burns. A prescribed fire is a fire conducted for specific, clearly stated purposes that is confined to a predetermined area under specific weather conditions and conducted by personnel with the required training and experience.

Conducted under optimum conditions, controlled burns can improve wildlife habitat and benefit wildlife.

Photo by Larry Berry/WV DNR Photo

Larry Berry/WV DNR Photo

Wildlife Resources Section employee uses a drip torch to light a prescribed grassland burn.

Prescribed burning is the most effective management tool to maintain and rejuvenate native grasslands. Prescribed burning also is beneficial to maintain old-field communities that are composed of a mixture of weeds, forbs, native grasses and shrubs. Prescribed burning reduces the amount of thatch (dead vegetation) at ground level, increases the variety of forbs, releases nutrients back to the soil, promotes vigorous warm-season grass growth, and suppresses the growth of competing invasive plants. Prescribed burning also produces more succulent vegetation that is more palatable to deer and rabbits, and supports a larger number of insects that are readily available to young birds.

Prescribed burns in grassland habitats are usually conducted from February through April. Fires should be conducted at this time of year to avoid the nesting season and to allow the previous year's grasses to remain as winter cover as long as possible. Woody

Larry Berry/WV DNR Photo

Most burns in forested areas are conducted in late winter and early spring when weather conditions allow managers better control of the fire.

vegetation that is encroaching into grasslands can be effectively controlled if prescribed burns are conducted from August through September.

Prescribed burns used to improve wildlife habitat in forested habitats are often used in conjunction with timber harvesting. Research conducted in West Virginia in the early 1980s found that timber thinning (either by mechanical or chemical means) followed by prescribed burning promoted a forest floor covered with nutritious herbs that were beneficial for wild turkey broods. Wildlife managers manipulate the amount of overstory canopy cover in the forest as well as the frequency of prescribed fire to guide plant community response following the fire. Typically, longer periods of time between prescribed burns will favor a woody understory. Shorter periods of time between prescribed burns will favor an understory composed of grasses and forbs. Recent research also has indicated that partial overstory removal in an oak stand followed by prescribed fire is a good way to establish oak regeneration in the next stand.

The time of year in which prescribed forest burns are conducted also will affect plant community composition following the fire. The majority of prescribed burns in forested habitat are conducted in February through April, similar to grassland burns. One of the toughest parts of prescribed burning in forested habitats is creating a fire hot enough to kill undesirable understory tree species but not hot enough to kill or injure desirable overstory trees. During late winter and early spring, large fluctuations in daytime temperature and relative humidity levels often allow better control of a prescribed fire. In addition, lower average daytime temperatures help to reduce fire intensity.

Wildlife managers who use prescribed fire develop a detailed burn plan before conducting a burn. The burn

A road serves as a convenient, effective fire break.

Boundaries for grassland fires are often created by disking the perimeter to expose bare ground.

plan includes a site description and map, personnel assignments, weather conditions under which the fire will be conducted, equipment availability, hazard areas, agency contacts, a contingency plan if the fire escapes, and the goals and objectives of the burn. Burn plans also describe smoke management concerns. Weather conditions on the day of a burn will influence smoke dispersal and must always be taken into consideration.

Fire behavior is influenced primarily by wind speed and direction, relative humidity and fuel moisture levels. In a burn plan, each weather condition has a range under which a prescribed burn is considered acceptable. If wind speed is too low, relative humidity is too high and fuel moisture is too high, prescribed burns will not burn hot enough to meet management objectives. If wind speed is too high, relative humidity is too low and fuel moisture is too low, prescribed burns have the potential to escape and cause damage to surrounding properties.

All prescribed burns are contained by a fire line or fire break of some kind. Burns conducted in grassland habitats often are surrounded by bare ground created with a tractor and either a disk or plow. Cool season grasses and legumes such as rye grass, orchard grass and clover also will serve as a suitable fire break. Fire breaks for prescribed burns in the forest can be constructed by a bulldozer, by hand with rakes, or with a leaf blower.

Colin Carpenter/WV DNR Photo

Larry Berry/WV DNR Photo

DNR personnel use a variety of lighting (firing) techniques when conducting prescribed burns. The technique chosen must be matched with burn objectives, fuels, topography and weather factors to prevent unwanted damage to the habitat being managed. Fires move with the wind (heading fire), against the wind (backing fire) or perpendicular to the wind (flanking fire).

Heading fires are the most intense type of fire because of a faster spread rate, wider flaming zone and longer flames. Heading fires are best applied in medium

Joe Calvert

Managers light a heading fire, burning with the wind to quickly burn large grassy fields.

to large sawtimber stands (trees greater than 12 inches in diameter) and in areas where hardwood leaves are the main fuel source. Heading fires burn rapidly and can be used to burn large areas in a short amount of time. Managers frequently use them to burn large, fallow fields and native, warm-season grasses. Heading fires should not be used in forested areas with large accumulations of heavy brush.

Backing fires are the least intense type of fire. Backing fires have a slow spread rate, narrow flaming zone and short flames. Backing fires should be used in young timber stands with trees less than three inches in diameter and in areas with large accumulations of heavy brush. Backing fires are the slowest type of fire and are not conducive to burning large areas in a short period of time.

Flanking fires, intermediate in intensity, are best used in medium to large sawtimber stands without a heavy accumulation of brush.

Steven Wayne Rotsch

Wild turkeys benefit from the nutritious regrowth and abundant insects which result from a controlled burn.

Flanking fires can be ignited rapidly to burn large areas, but need to have a consistent wind direction. Fewer control lines are needed with flanking fires than backing or heading fires.

Most wildlife managers use a combination of firing techniques when conducting prescribed burns. The two most common techniques are backing fires and heading or strip-heading fires. Typically, a backing fire is used to create a large black area on the downwind side of a prescribed burn area. When the backing fire has created a significant black area, narrow strips of heading fire are lit and allowed to burn toward the backfire. Essentially, the backing fire is used as a buffer to prevent the fire from spreading out of control.

Prescribed burns are complicated to organize and execute and should only be attempted by trained professionals. Unfortunately, the areas in which prescribed fires are most beneficial also are the areas where problems with wildfires are greatest. However, if care is taken in planning and carrying out a prescribed burn, the reward will be well worth the effort.

If you're hunting on a West Virginia wildlife management area or one of our national forests and see a recently burned area, make an effort to come back and see what it looks like one or more years down the road. You'll be surprised at the variety and abundance of plant and animal life that is calling the once blackened area home.

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