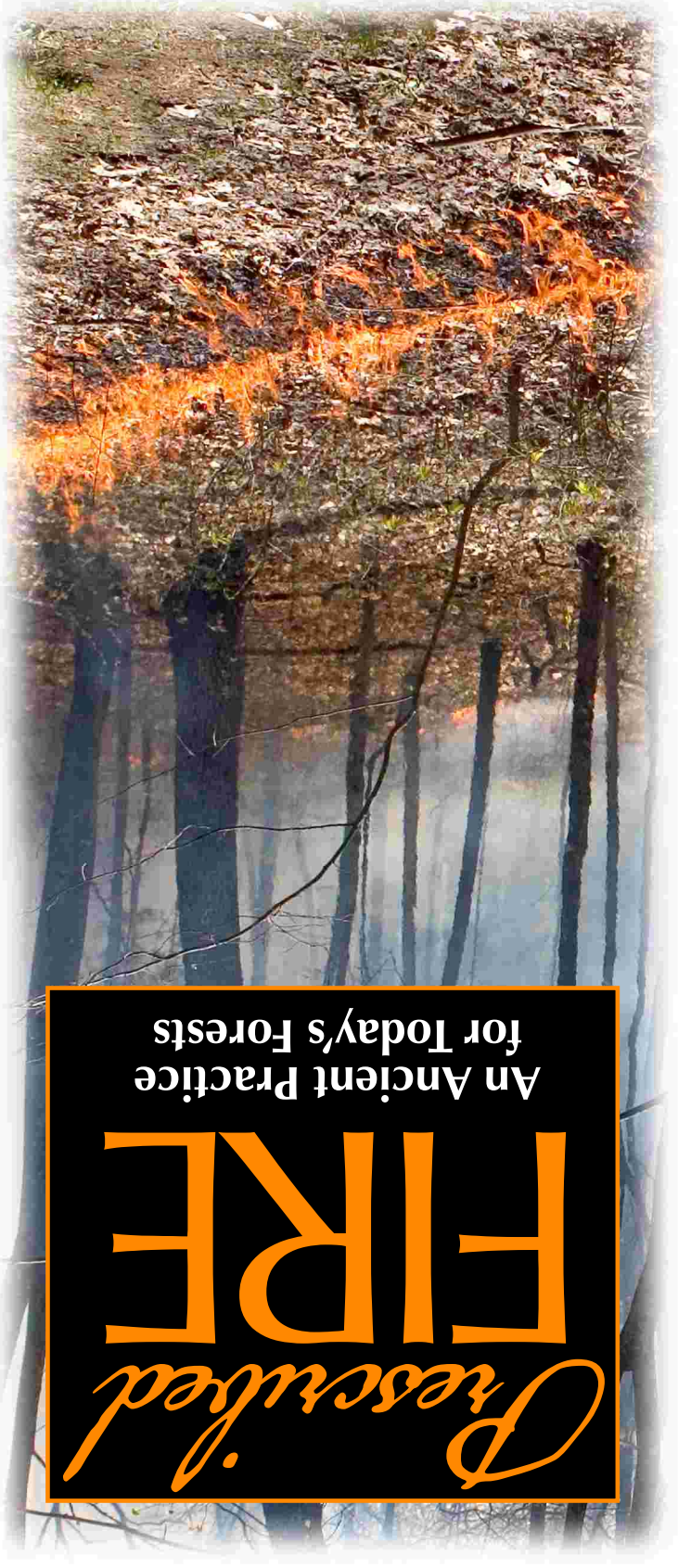


Prescribed FIRE
An Ancient Practice for Today's Forests

Human's relationship with fire has existed for ages. We have always manipulated our environment and interacted with the land. The land today is a reflection of such past and present use. Native Americans knew long ago the importance of fire on the land. They used fire to thin dense forest growth and to open the ground to sunlight, which enhanced plant cultivation. Fruit-bearing shrubs, such as wild blueberry, became more abundant after a fire. Grasses appeared in the forest understory, improving browse for game species and other wildlife.

An open forest with grassy understory promotes forage for wildlife.

The Daniel Boone National Forest is using one of the oldest land management tools known to mankind – prescribed fire. A prescribed fire is a controlled fire that is set with specific management goals in mind. Forest managers continue to learn about the benefits of prescribed fire, recognizing the negative impact that many years of fire suppression has had on forest vegetation and wildlife. Our goal is to return fire to the landscape to maintain the current forest diversity that is diminishing with fire suppression and the lack of other disturbances.

Flames of the Past

The early European settlers to North America continued the use of fire across the landscape. They expanded the open areas for grazing livestock and for agricultural development. Logging furthered the expansion of open land, and much of the openness was maintained by increased settlement and expanded land use. By the early 1900s, much of the Appalachian forests had been harvested, and fire was replaced by mechanized equipment to clear vast acres for development.

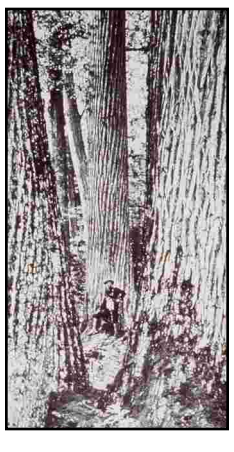
Logging during early settlement caused hillside erosion due to lack of vegetation.

Slash fires often followed early logging, especially during periods of drought. The sparks from steam engines pulling railroad cars loaded with logs often started the slash fires. These uncontrolled fires were often intense, with damaging impacts on vegetation. Without sufficient vegetation to stabilize the soils on steep slopes, impacts of erosion quickly became evident.

These destructive fires coincided with the advent of forestry, contributing to growing sentiment that fire had no place in the management of America's forests. State and federal agencies were created and organized to promote fire suppression.

Fire suppression efforts are organized during the early 20th century.

With fire suppression successfully implemented, our forests began to change. Tree species intolerant of fire became increasingly abundant within the forest, and the wildlife that once depended on fire-associated vegetation for forage was affected by the loss of fire. Wildlife was further impacted by the loss of the American chestnut tree, a significant mast-producing species lost to an infectious blight that invaded our eastern forests in the 1940s.



Chestnut trees once flourished in Kentucky's forests.

The Future of Fire

Ongoing research is being conducted on the Daniel Boone National Forest to determine the effects of prescribed fire on the forest. With fire alone, restoration of the forest structure and species composition is expected to be a long-term process. It may be years before the effects of prescribed burning can be fully understood. Forest managers may then determine how prescribed fire contributes to forest health and wildlife habitat. They can weigh the benefits against the damages and determine how best to use prescribed fire in conjunction with other tools, such as careful thinning, in forest management. How often should we burn to promote oak regeneration? What species will benefit most from fire? These are some of the questions that researchers hope to answer.

In many ways, we have come full circle from the beginning of the Forest Service in 1905, when all fire was rejected and considered bad for the forest. Today, we believe that most forests are adapted to and dependent on fire for survival. The Daniel Boone National Forest will continue to support ongoing research to test these assumptions. Maintaining the health of our forests and sustaining the diversity of species requires that we determine the right answers.

A pyrometer records temperature during the burn.

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Oak seedling sprouts new growth following a prescribed fire.

Why Are We Burning?

The structure and species composition of the forest has changed since fire suppression was put into place. Mast producing trees important to wildlife struggle to reproduce. With fire suppression over many years, our forests have shifted from an open mix of oaks and yellow pines to increasing dominance by maples, white pines, hemlock, and other fire-sensitive species. A dense midstory and understory of vegetation in the forest canopy has developed, limiting the regeneration of oaks. Oak seedlings need sunlight to survive, and prescribed fire offers a key tool for creating the open forest conditions necessary for their growth.

Scientific research has rediscovered the ecological value of fire, along with the economic advantage of fire over machine on a landscape scale. The return of prescribed fire to the forest is expected to help meet the "desired future conditions" of particular woodland areas. The reasons for prescribing fire today are the same as thousands of years ago.

Prescribed Fire May Be Used To...

Improve Forest Health

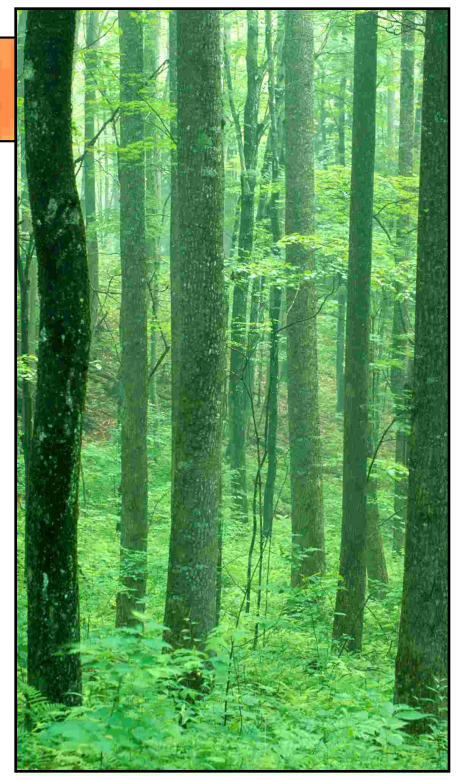
Today's forest managers realize that the return of fire to our forests can be an important component for maintaining and improving forest health. The effects of many years of fire suppression have limited forest diversity and prevented the regeneration of tree species that provide food for wildlife. Prescribed fire is one tool that forest managers can use to promote plant diversity and encourage a forest structure that is healthy and sustainable.

Returning our upland forests to the open conditions that existed when Native Americans used repeated fire to manage the land is expected to support the development of healthier forests. Fire exclusion over the past several decades has contributed to denser forests in which shade-tolerant and fire-sensitive species, such as red maples, thrive. Meanwhile, oak seedlings that need sunlight to survive are succumbing to the shade of these aggressive forest competitors.

In addition to dense forest conditions, America's forests are undergoing a plague of exotic insects that have entered our country through the shipment of trade. These insects are destroying native tree species important to our economy and to the North American ecosystem. In addition to the gypsy moth which feeds on oak trees, the emerald ash borer and hemlock woolly adelgid have the potential to threaten the functioning of our forests.

The Daniel Boone National Forest is taking these threats seriously. Prescribed fire is one of the tools that may be used to decrease tree density and control the spread of destructive insect invasions.

A recent southern pine beetle epidemic killed the majority of yellow pines on the Daniel Boone National Forest, primarily because of existing dense forest conditions. By restoring an open forest condition, pine seedling growth may be encouraged where pine trees survived. The planting of pine trees will be required where there are no survivors.



The seedlings in the understory of this dense forest struggle for sunlight and survival.

Red maple stump sprouts are set back after a prescribed fire is repeated in this area.

Restore Ridgetop Ecosystems

On dry ridgetop sites, species such as oaks and yellow pines are losing ground to fire-sensitive species such as red maple and eastern white pine. Studies of forest history show that fire-sensitive species were once uncommon on ridgetops prior to fire suppression.

Prescribed fire may be used to reduce forest density and open the forest floor to increased sunlight.

An open forest promotes species diversity through the reproduction and healthy growth of shade intolerant tree species such as oaks. Prescribed fire may reduce the density of fire-sensitive species such as red maple and white pine. These species tend to sprout back after burning, so additional methods may be needed to maintain an open forest structure.

Maintain Wiildlife Habitat

Within the guidelines of the Daniel Boone National Forest Land and Resource Management Plan, a number of habitat types will be created across the forest landscape. By using prescribed fire, most of these habitat types will resemble pre-European conditions with fewer trees in the overstory and an increased amount of warm season grasses on the ground.

Some areas may feature dense brush in the undergrowth. Oaks and yellow pines are expected to once again dominate the forest canopy, with plenty of seedlings for regeneration. Fire sensitive species will be restricted to wetter areas where fires occur less often. These varying conditions will benefit a wide array of rare, sensitive flora and fauna and nearly all game species.

A grassy understory in the upland forest will likely decrease the need to develop wildlife openings for forage. Such habitat types will be maintained by repeating the use of prescribed fires on the landscape.

Wild turkey habitat is improved with prescribed fire.

A drip torch is used to ignite a prescribed fire.

Reduce Forest Fuels

Leaf litter and woody debris on the forest floor serve as fuel for uncontrolled wildfires. Late winter fires may consume the leaf litter and small woody debris, but the fuels are replaced annually.

In the dry climates of the western United States, woody fuels decompose very slowly and, in the absence of fire, may accumulate and eventually lead to destructive wildfires over vast acres.

Such wildfires do not typically occur in the eastern region where woody fuels decompose more quickly due to moisture.

Some disturbances, however, can cause expansive forest mortality in a short period of time and result in large amounts of woody fuels on the forest floor. Damaging winds, ice storms, and insect infestations have impacted much of the Daniel Boone National Forest within the past decade. The resulting woody debris presents a danger for unplanned and uncontrolled wildfires to occur.