May 1998

USING FIRE TO REDUCE RISKS TO SOCIETY AND THE ENVIRONMENT

Fire is important to the health of many wildland ecosystems, including forests and grasslands. Because fire has been withheld from these ecosystems for so long, the increased use of planned or prescribed fire is essential to effectively manage resources in many wildlands. Fire suppression practices, of course, continue to be imperative for protecting public safety and property, but properly managed fire will actually reduce the risks to society associated with catastrophic wildfires, including threats to human health and property. Prescribed fire must be used in a judiciously and carefully planned fire management program. Effective fire management practices include:

- Reducing hazardous fuel accumulations (e.g., dead trees, branches, and vegetative matter on forests floors) by prescribed fire, mechanical means, or both

- Using smoke management techniques during prescribed burns to minimize the impacts of smoke on populated areas and on visibility in national parks and wilderness areas. These techniques include, conducting prescribed burning during favorable weather conditions and controlling the amount of fuel and acreage burned

- Whenever possible, using mechanical thinning, such as selective timber cutting or tree removal, as a pre-treatment to prescribed burning

- Implementing fire hazard awareness and mitigation programs for private landowners

- Involving affected parties in planning fire management activities

Owners and managers of private and publicly owned lands in the wildland/urban interface (where houses and structures have been built) and air regulators should work together to reduce the risks wildfires pose to public health and safety. Homeowners should also look for ways to decrease natural and human-made fuels on their lands. Fire experts in local fire or disaster services, State foresters, fire marshals, and Federal wildland fire agencies can provide information on fire safety. The website, www.firewise.org, provides information on ways homeowners can protect themselves and their property from wildland fire.

Smoke management programs (SMPs) help minimize public health and environmental impacts from smoke. State SMPs are developed with input from State and local air quality agencies; Federal, State, and tribal land managers; private landowners; and the general public. They help meet Federal air quality standards and protect visibility in national parks and wilderness areas.

Cooperative firefighting agreements among neighboring States, Federal agencies, and tribes

greatly improve firefighter response time and provide increased protection of public safety and property.

As the use of prescribed fire is increased, land managers and air regulators must work cooperatively. Integrated planning efforts are needed if fire and smoke management practices are to meet environmental and public health goals. Agencies must work together to inform the public about the benefits of prescribed fire activities, including how smoke management programs are used to reduce the impacts from smoke. For fire to be used successfully as a resource management tool, we all need to become better informed about fire and fire management practices.

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THE ROLE OF FIRE IN NORTH AMERICA

Fire has always been a part of the North American landscape. Fire has helped shape many of our wildlands (such as forests and grasslands) for thousands of years. As these wildlands have adapted, fire has become essential for their health and survival. Fire promotes ecosystem diversity and can improve soil conditions, wildlife habitat, and forest health.

Native Americans used fire to clear areas for villages and farms, to make travel easier, to attract game animals, and to eliminate hiding places for enemies. However, European settlers brought a different philosophy regarding fire. They perceived fire as a threat and believed it should be eliminated whenever possible. Consequently, public policy has long encouraged preventing and suppressing fire to protect public safety, property, and our wildlands.

Unfortunately, this policy ignores the important role fire plays in the long-range health of our ecosystems. We now know that vigorous fire exclusion practices have had many unexpected and unwanted consequences. Past suppression efforts have affected the health and threatened the very existence of many plant communities. In many parts of North America, fire suppression has caused changes in types of vegetation, significantly altering ecosystems. Forests in the North American landscape now function much differently than they did a century ago. Many forests are now more susceptible to insects, disease, and drought. Increases in forest density and changes in tree and plant species have also altered forest composition. Periodic low intensity fires used to naturally thin forest stands and reduce the build-up of "flammable fuels" or debris (logs, small trees, fallen branches, etc.), allowing the remaining trees to grow taller and healthier. Fire suppression practices, of course, continue to be important for protecting public safely and property, however past practices of suppressing virtually all fires have led to a dangerous build-up of fuels in many wildlands. In recent years, the number and size of catastrophic wildfires have increased and these fires are burning hotter and emitting more health-threatening pollutants than ever before.

A fire occurring in an area with a heavy build-up of fuels (e.g., an abundance of dead and downed trees) will produce much more heat. That intense heat can damage and kill trees and scorch the soil, making it prone to erosion and unstable for the regeneration of vegetation and less productive.

Land managers are now using planned or "prescribed" fire as an important tool for restoring our wildlands to health and reducing the risks to human health and property associated with catastrophic wildfires. Unlike catastrophic wildfires, prescribed fires can be managed to yield benefits for ecosystem health and public safety, while minimizing smoke impacts on air quality. Techniques are used to minimize smoke impacts, including burning only under certain weather conditions and controlling the amount and type of fuels burned. Prescribed fires encourage biological diversity. Prescribed fires, typically conducted in areas with "light" fuels during cooler

weather, can be beneficial rather than damaging.

Fire can help seeds germinate by removing ground cover (fallen needles, leaves, and branches), releasing nutrients into the soil and exposing them to sunlight. Fire is also a natural recycling agent that helps maintain the balance between plant growth and decomposition.

Over the long-term, the frequent use of smaller, prescribed fires will decrease the potential for serious health effects resulting from smoke and pollutant emissions that come from large wildfires. The restoration of fire to our landscape, in the form of carefully managed prescribed fire, is important. It can have a positive long-term effect on our environment and on our public health and safety.

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EFFECTIVE WILDLAND FIRE MANAGEMENT

Throughout most of this century, Americans considered all fires on wildland forests and grasslands, whether caused by lightning or humans, to be harmful. We assumed all fires did little other than threaten wildlife, decrease timber values, and threaten human life and property. Consequently, fire was vigorously suppressed throughout most of North America.

Yet the result of this national campaign has had almost the opposite effect. As we stunted the spread of wildland fire, the health of many of our forests and grasslands deteriorated. Fire suppression practices were and continue to be imperative for protecting public safety, property and valuable timberlands and other resources. But our suppression of low-burning ground fires that once thinned undergrowth and helped rejuvenate native plants and trees on a regular cycle has now allowed fast growth of new tree and non-native plant species. These species compete for space and erode the health and stability of many ecosystems and wildlife habitat.

What's worse is that our century of fire suppression has also dramatically increased the frequency and intensity of catastrophic wildfires, which can burn out of control for weeks, destroying thousands of acres of forests and posing severe threats to life and property. Because smaller, more frequent fires no longer reduce and recycle the buildup of "flammable fuel" (logs, branches, etc.) on the forest floors, uncontrollable wildfires now burn hotter and faster than ever before. Lately, wildfires have also become larger -- emitting more pollutants that threaten human health and welfare and impair visibility in our national parks and wilderness areas.

Unknowingly, through all-too-effective fire suppression activities, humans have both weakened the health of wildland ecosystems and caused an increase in the frequency of catastrophic wildfires. The lack of periodic fires in many unmanaged wildlands has increased the risks to both the environment and society.

Federal, State, tribal and local land managers now recognize the need to change past practices. They have learned that careful and effective use of fire protects people who live near or recreate in public lands. Also, they know that using fire as a tool can reduce the risks to the firefighters who protect our lives, land, and property. It can also restore native habitat to help prevent the extinction of species. Of the 145 endangered and threatened rare plant species in the United States, 134 are known to benefit from wildland fire.

By carefully using planned or prescribed fire along with "mechanical treatments" in selected locations, land managers reduce the fuels that can lead to catastrophic infernos. In many areas prescribed fire cannot be used effectively without first removing excess fuel loadings, such as logs, branches, and brush. Mechanical treatments include selective cutting, thinning or pruning of trees and the use of chains or cabling to remove branches. Prescribed fires -- conducted during

favorable weather conditions -- reduce heat, flame size, and smoke, which in turn, minimizes adverse impacts on public health and the environment.

In the long run, using prescribed fires and mechanical treatments to reduce fuels now reduces costs associated with suppressing large, unwanted wildfires later. The average cost of prescribed fires is significantly less than the costs spent to suppress catastrophic wildfires. By carefully returning fire to our forests and grasslands today, we can help restore health, safety, stability, integrity and productivity to the land.

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DEFINING FIRE MANAGEMENT: PREVENTION, SUPPRESSION, AND USE

FIRE PREVENTION

Fire “prevention” includes teaching the dangers of unwanted fire and the adverse effects of unmanaged wildland (forest, range, and grassland) fires. Fire prevention practices help protect against fires caused by lightning or by human accidents and include taking practical steps to reduce hazardous “fuel” build-up of flammable materials (e.g., fallen logs, branches, and shrubs) on forest floors. Fire prevention includes using carefully planned fires, called “prescribed” fires, or mechanical methods, such as selective cutting, thinning or pruning of trees. These methods help “defuse” the fuel behind recent wildfires, which often start during the hottest, driest, and windiest days and become increasingly difficult to control.

Smokey Bear, the most famous symbol of wildland fire prevention, still has a powerful message: "prevent forest fires.” Fire suppression practices continue to be imperative for protecting public safety and property and important natural resources, such as timberlands. Unfortunately, however, Smokey's message has often been interpreted to mean that all fire is bad and should be suppressed. Aggressive fire suppression activities for nearly a century have resulted in many wildland areas that are unhealthy and volatile. The heavy fuel buildup in our wildlands has contributed to the quantity and size of recent catastrophic fires.

FIRE SUPPRESSION

Fire “suppression” means action taken on wildfires to protect life and reduce damage to resources and property. In the last decade, fire suppression efforts in wildland ecosystems have escalated because of the increased intensity of the typical wildfire from years of fuel buildup. Because of the need for more personnel and larger, more expensive equipment to battle the blazes for longer periods of time, fire suppression costs have spiraled upwards. Suppression tools now often include an arsenal of equipment like rough-terrain fire engines, large bulldozers, helicopters, and air tankers. Suppression costs from the 1996 fire season alone approached a billion dollars. The average cost of prescribed fires is usually significantly less than the costs for suppressing catastrophic wildfires.

FIRE USE

Fire “use” is the application of fire to meet specific land management objectives. The planned use of fire in wildland areas, prescribed fire, can achieve a variety of land management objectives. Low-intensity prescribed fires reduce the amount of accumulated fuel -- dead and downed trees, branches, vegetative matter -- on the forest floor. It also can lessen the chances of total loss of forested or other wildland areas to wildfires. Fire is also vital for the propagation of native species

of plants, such as longleaf and Pitch pine, Giant sequoia, redwoods, and some threatened herbaceous plants. An effective managed fire program -- smaller, more frequent, low-intensity prescribed fires -- will produce stands of trees and plants having more varied ages. Such varied-aged stands increase the diversity of both plant and animal species, producing healthier ecosystems that are more resistant to insect outbreaks and large wildfires.

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WILDLAND FIRE AND AIR QUALITY

The Clean Air Act requires the Environmental Protection Agency (EPA) to review (and revise, if necessary) national air quality standards at least once every five years to provide strong public health and environmental protection. EPA has set national air quality standards for six common air pollutants: ground-level ozone (smog), carbon monoxide, sulfur dioxide, lead, nitrogen dioxide, and particulate matter.

In July 1997, the EPA revised the national ambient air quality standards (NAAQS) for particulate matter and ozone. The new standards provide additional health protection against air pollution for 125 million at-risk Americans, including 35 million children. In addition, EPA's proposed new Regional Haze Program addresses visibility impairment in those national parks and wilderness areas given special protection under the Clean Air Act.

The particulate matter in smoke can penetrate and remain in the deepest regions of the lungs and can cause persistent coughing, wheezing, and pain. "Fine" particles, those less than 2.5 micrometers wide (about 1/30 the diameter of a human hair), are a great health concern because exposure to them may increase the rate of respiratory and cardiovascular illnesses and even reduce life expectancy.

Smoke from fire is part of the natural environment. It is composed of particulate matter and other pollutants. The new air quality standards for particulate matter include new, stricter limits on concentrations of fine particles. Most of the particles in smoke are less than 2.5 micrometers in size.

EPA is also concerned about the significant impacts that fine particles from smoke have on visual air quality, or visibility. This is of particular concern in the more than 150 national parks and wilderness areas, where scenic vistas are particularly important. EPA's proposed new Regional Haze Program, combined with the new air quality standards for particulate matter, should improve the visibility not only in these areas, but also throughout the country.

EPA believes that its new air quality standards are necessary to increase public health and visibility protection. The Agency also recognizes that fire is essential to effective ecosystem management and that an increase in carefully conducted prescribed burning can improve the quality of fire-dependent wildlands. Fire plays a vital role in the maintenance of healthy forests and rangelands. Increases in the amount of prescribed fire will also minimize the occurrence of fast-spreading catastrophic wildfires in many areas by reducing the buildup of flammable "fuels" like fallen trees, branches, and needles in our forests. Mechanical treatment, which includes selective cutting, thinning and pruning of trees, is also needed as an effective land management tool in many circumstances. However, mechanical treatments alone cannot replace the use of prescribed fire for restoring ecosystem health; certain plant communities rely on fire for regeneration and fire

speeds the release of important nutrients into the soil that help trees and plants grow healthy and strong.

EPA and its partners believe that protecting public health and visibility can be accomplished in concert with increases in prescribed fire. However, to do so, land managers who use fire to accomplish land management objectives must use effective smoke management techniques. These techniques include scheduling burns during favorable weather conditions, using proper ignition methods, and controlling burning periods. Unlike catastrophic wildfires, prescribed fires utilize these smoke management techniques to minimize air pollution that could otherwise adversely affect the public health and welfare.

EPA has worked in partnership with State and local agencies; Federal land managers (FLMs); industry representatives; environmental groups, and other Federal agencies to develop a national policy, EPA's Interim Air Quality Policy on Wildland and Prescribed Fires, that advocates the increased use of prescribed fire while ensuring protection of air quality and public health. The Policy was developed in coordination with the Subcommittee on Ozone, Particulate Matter, and Regional Haze Implementation Program, which was formed, under the auspices of the Federal Advisory Committee Act (FACA). The FACA subcommittee, which is comprised of a wide range of stakeholders, helped EPA develop flexible and cost-effective implementation strategies for the new air quality standards and the proposed Regional Haze Program.