



# SMOKE SIGNALS

*The Need for Public Tolerance and  
Regulatory Relief for Wildland Smoke Emissions*

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Ethics, and Ecology (FUSEE)

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## Summary

Land managers and residents of the western United States face a dilemma. Large areas of public wildlands, with their scenic landscapes and outdoor recreation opportunities, attract millions of people to the West. But these federally-managed wildlands are prone to burn. When they do, air quality standards may be exceeded and, even if not, persons who find the smoke a nuisance may put pressure on air quality regulators to eliminate it. Yet these lands require occasional fire for their ecosystems' health. Indeed, fire has played a vital role in maintaining many of the scenic and recreational resources that Americans enjoy.

Without human interference, most wildland areas would experience much higher levels of fire than they do today. The levels of smoke emitted by today's fires, though high during brief isolated events, are overall unnaturally low compared with pre-1900 levels. This has resulted from well-intentioned but misguided fire suppression policies that have degraded public lands. Recent decades' expensive and increasingly counterproductive fire suppression efforts have only delayed the occurrence of wildfires, not eliminated them.

Today's federal land managers understand the need to allow or facilitate burning on millions of acres of wildlands, both to restore their ecological health and to help protect nearby human communities from future high-intensity wildfires. Further, many climate change models indicate that most of the West will face larger and more frequent fires over the next few decades, making controlled burning today all the more necessary. But land managers face significant obstacles, chief among which are current air quality regulations stemming from the federal Clean Air Act.

Federal and state air quality regulators routinely seek to reduce smoke from wildland fires. This occurs primarily because the air is already polluted by human-caused urban, industrial, and agricultural sources. Applying strict air quality regulations to smoke from wildland fires, however, poses a direct impediment to the good management of public lands. In addition, the more fires are suppressed now, the more unruly future fires will be, potentially producing far more smoke if they burn during extreme conditions.

Fire managers can and will continue to manage wildland fires to reduce smoke emissions. But wildland fires are natural events, beneficial to the environment, and as such must be exempted from Clean Air Act regulation.

This paper discusses:

1. Why forest and rangeland fires and the smoke they emit are inevitable, and how the historic deficit of fire on public land, in addition to climate change, will lead to more fire in the coming decades;
2. How fire management has changed as scientists have come to understand the vital, essential role of fire in restoring and maintaining the ecological health of wildlands;
3. How Clean Air Act regulation of wildland fire smoke is forcing land managers to institute regressive, expensive, and counterproductive fire suppression policies that go against the best science and merely defer smoke emissions into the future; and
4. How land managers can apply fire management strategies and techniques to lessen smoke emissions while allowing more fires to burn.

## Wildland Fire's Role in a Healthy Environment

Efforts to exclude fire and prevent smoke in wildland areas are unrealistic and destructive because fire is inevitable and ecologically necessary in many western ecosystems. In most areas of the western U.S., fire started by lightning or humans has been a part of native ecosystems for thousands if not millions of years. Plant communities in all but the wettest areas have not only adapted to fire but depend on it as a key force that regulates forest structure and species composition, recycles dead plant material into soil nutrients, and renews biological productivity. One example of such dependence is that the seeds of hundreds of plant species require heat for germination, as is witnessed in the explosion of wildflowers after a wildland fire.



*Wildland fire is a normal, natural, inevitable process that is vital for many ecosystems across the U.S. and wherever there is fire there will be smoke.*

In prehistoric and historic times, some native peoples burned range or forest areas to improve travel or enhance hunting and harvesting opportunities. Dry lightning storms also regularly ignited wildland fires, which burned unhindered throughout the West. With abundant recurring ignitions from lightning and native peoples, many ecosystems, wildlife and vegetation species evolved with adaptations that enabled them to survive and even thrive with fire.

### The Fire Deficit

Human interference, however, has drastically reduced the number of acres that burn today compared to the past. Up until the 1940s an average of 10 to 20 million acres burned annually in the West. Wildfire suppression actions over the last several decades have limited fire to around four million acres per year. The difference in annual acreage that would have burned without suppression compared to the area that actually burns is called the “fire deficit.” Dr. Michael Medler of Western Washington University has calculated the annual fire deficit in the eleven western states to be about 12 million acres – and these acres accumulate every year. This accumulating fire deficit has a profound negative impact on the species, ecosystems, and landscapes where fire is a necessary and beneficial ecological force.

In the early 1900s when the U.S. Forest Service was created, many foresters thought extinguishing fire was their basic duty because they viewed fire simply as destructive to the forests’ timber supply. At first they were little able to keep up with ignitions across almost 200 million acres of national forest land. But after the 1910 “Big Burn” fires in Idaho and Montana, the Forest Service was provided with significantly more funding and technology for fire suppression. The agency thereafter dedicated itself to systematically suppressing and attempting to exclude fire from all the forest and rangeland ecosystems it managed, unwittingly forcing a major ecological shift that degraded forest health and ecological integrity across vast areas of public lands.

### Re-Introducing Fire

Ecologists like Aldo Leopold, himself a member of the Forest Service, began to have second thoughts about this exclusion of fire as early as 1924. Decades of ensuing debate backed by scientific research in the new field of “fire ecology” culminated in a new policy of reintroducing fire to national park lands in California in the 1970’s, and ultimately to a policy today in which fire is gradually being restored to its natural role on many public lands. These lands include the Forest Service’s 190 million acres, the National Park Service’s 84 million acres, the Bureau of Land Management’s 255 million acres, the Fish and Wildlife Service’s 92 million acres, and the Bureau of Indian Affairs’ 55 million acres.



*Land managers must ignite prescribed fires in order to restore lands damaged by past fire exclusion. Although this may temporarily obscure scenic vistas, fire helps maintain landscape beauty and land health over the long run.*

Fire is being re-introduced to the land in two ways. 1) Prescribed fires (controlled burns), carefully planned for specific well-defined geographical units, are started when temperature, wind, humidity, fuel moistures, and other factors precisely meet the managers’ “pre-scription” to restore the land to health. 2) Fires caused by lightning may also be “used,” that is managed and allowed to burn within pre-planned limits for specific purposes. These management methods generally have two goals: improving the ecosystems’ health and lessening the likelihood of an intense fire in the same area when future conditions are dangerously windy or dry. Overall, however, due to numerous hurdles federal and state land management agencies continue to suppress the majority of wildfires, perpetuating the fire deficit.

### **The Need for Smoke**

Consequently, a “smoke deficit” has accompanied the fire deficit. According to fire ecologist Bill Leenhouts, smoke from wildfire has decreased seven-fold compared to pre-suppression times. Skies were consistently more smoky and hazy in the past, as fires burned frequently and naturally across the landscape. In 1898, Dr. C. Hart Merriam, Chief of the federal Division of Biological Survey, wrote: “Of the hundreds of persons who visit the Pacific coast in California to see the mountains, few see more than the foreground and a haze of smoke which even the strongest glass is unable to penetrate.” Each of these regular fires produced less smoke than today’s wildfires, burning as they did in light fuels as opposed to today’s heavy fuels accumulated from decades of fire suppression. Yet they were much more numerous and pervasive. Thus even though smoke from today’s individual wildfire events can be intense, overall smoke from these sporadic fires is far less than what persisted throughout the West during fire seasons before 1900.

The concept of a “smoke deficit” may seem strange. One might say that if smoke contributes to air pollution, then smoke is only a detriment. Yet within the larger ecosystem context, smoke plays a necessary role. For reasons still being studied, the seeds of some plant species require exposure to smoke in order to germinate. Smoke also keeps certain insect populations and tree pathogens at bay. Excluding all smoke therefore could interrupt the natural cycles and environments in which these plants live. As scientists continue to document the many natural and necessary ecological functions of fire, so too they are discovering related beneficial effects of smoke.

## **Impacts of Climate Change**

Climate change is increasing the number of large-scale wildfires in some regions of the West. Since 1987 large-scale western wildfires have become four times more frequent than in the two preceding decades. Further, the average wildfire season is now 78 days longer than in the 1970’s, and efforts to contain and control large wildfires are taking five times longer on average. Dr. Anthony Westerling and other fire researchers predict that large wildfires in California will increase more than 50% by the year 2100. A study by Dr. Olga Pechony and Dr. Drew Shindell of NASA’s Goddard Institute of Space Studies projects a 30% to 60% increase in wildfire activity in the western U.S. by 2100, with the next century experiencing rapidly rising temperatures, regional drying, and rising wildfire abundance, regardless of how successful people are in reducing greenhouse gas emissions.

Although climate change effects may vary widely in different places, most of the western U.S. will experience a significant increase in wildfire activity along with weather conditions that fuel large-scale, high-intensity fires. It is therefore imperative that land managers today be free to conduct low-intensity burns which will lessen the possibility of future fires becoming destructive to human communities or unnaturally severe to wildland ecosystems.

## **Smoke Regulation: Flying in the Face of Ecological Restoration**

In heavily populated areas that experience chronic air pollution from urban, industrial, and agricultural sources, wildland smoke emissions have become a major issue for air quality regulators and land managers. Most western air pollution comes from automobiles, coal-fired power plants, farms, oil wells and refineries, and other industry. This pollution is regulated by the federal Clean Air Act, which sets limits for specific pollutants to protect human health and, at select places, visibility. In some areas, industrial sources alone emit so many pollutants as to push the Clean Air Act’s limits. When a wildfire or prescribed fire produces additional smoke, it can push air quality “out of attainment,” causing legal problems for local and state air quality regulators and for federal land managers.

The Clean Air Act considers smoke from any kind of wildland fire to be a human source of pollution, the same as when a farmer burns orchard trimmings. Smoke from an out-of-control wildfire may theoretically be exempted from the Act’s provisions, as will be discussed below. But if land managers light a prescribed fire or manage a wildfire to benefit forest health, air quality regulators treat its smoke as human caused.

These regulators therefore allow federal agencies to carry out prescribed fires only when industrial pollution levels are low enough that



*Most air pollution is caused by urban, industrial, and agricultural sources that constantly or chronically emit unhealthy emissions, unlike wildfires that create temporary smoke events.*

the fires' smoke will not push the local airshed "out of attainment." In states like California, with huge areas of public land dependent on fire for their ecological health, managers at places like Yosemite National Park or the Stanislaus National Forest are finding fewer and shorter opportunities to ignite controlled burns – even as the need to burn more acres increases each year.

Before lighting prescribed fires, land managers must prepare detailed smoke management plans (SMPs) and apply to the state for permits. Even an approved permit and SMP may not be enough. If nearby industrial pollution is heavy, air quality regulators may demand that an ongoing prescribed fire be "shut down." The fire's managers are then forced to use expensive, damaging fire suppression techniques in order to accommodate industrial pollution in their airshed.

Amidst this restrictive regulatory environment, fire managers know their lands need to experience more fire, not less. Paradoxically, the "burning needs" of federal lands are in direct conflict with federal air quality regulations. If fire management programs are overly constrained by air quality regulations, federal lands could suffer significant ecological deterioration, and the risk of high intensity wildfire entering communities will increase.

### History of Air Quality Regulations

Since the late 1950s, air quality regulations have become more detailed and stringent as science has revealed the detrimental effects of various airborne pollutants on public health. The U.S. Environmental Protection Agency (EPA), created in 1970, is the primary regulator of air quality in the United States. The Clean Air Act, which it administers, provides the framework under which state and regional air quality authorities monitor and regulate air pollution.

Amendments to the Clean Air Act in 1970 created the National Ambient Air Quality Standards (NAAQS), which seek to control potentially harmful pollutants by setting limits on the concentrations of six specific pollutants in a given air district over a set amount of time.

Of these six so-called "criteria" pollutants, fire emits four: carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter. Fire emissions can also become ozone, another criteria pollutant, when exposed to the right weather conditions.



*In areas where urban air pollution levels cause air districts to be classified as "non-attainment" areas, it is difficult for fire managers to use fire for ecologically beneficial purposes.*

State and local air districts monitor local (ambient) levels of specific pollutants by setting up stations that sample the air in areas with high pollution levels. Regulators can trace the source of pollutants to some extent with these monitoring data: for example, they can isolate forest smoke from urban auto exhaust. States submit their monitoring data to the EPA, which uses the data to determine if counties or air districts are classified as "nonattainment" areas for one or more criteria pollutants. If an area is in nonattainment, the state must produce a State Implementation Plan (SIP) that addresses the sources of pollution. If an air district has too much of a particular pollutant, regulators can require its source to reduce them, mandate expensive modeling exercises, and in extreme cases levy fines or take other punitive actions.

Prescribed fires are one of many sources that state air regulators consider when they need to control pollutants. The Smoke Management Plans created by fire managers attempt to meet the needs of regulators and mitigate smoke impacts on populated areas. However, fires are complex events that are not always predictable given the range of factors that influence fire behavior and smoke output. Wildfire smoke is not as controllable as human-caused sources such as the air pollution billowing out of a smoke stack or tailpipe.

## Visibility and Fire

In addition to the health-based concerns addressed in the Clean Air Act, air regulators also focus on regional haze and the visual impacts of particulate matter. In 1977 Congress amended the Clean Air Act to begin to address increasing haze which was ruining views at many areas of scenic importance, which are designated “Class I areas.” After two decades of research, analyses, and further Congressional actions, in 1999 the EPA issued the final Regional Haze Rule, which is intended primarily to improve visibility in 156 national parks and wilderness areas across the U.S. and secondarily to improve air quality in general. The Regional Haze Rule directs each state to determine how it will implement the program. The Smoke Management Plans required for prescribed fires are a result of this Rule.

In many if not most situations, the smoke produced by wildfires does not violate the NAAQS regulations for specific pollutants, but it may threaten goals for improving visibility. This presents one of numerous tradeoffs in environmental restoration and recreation goals: haze regulations help protect the scenic beauty of landscape vistas, but if these regulations unduly restrict prescribed burning or force managers to aggressively suppress wildfires, fire-adapted ecosystems suffer negative effects that also can degrade their scenic beauty and recreational values for hiking, camping, fishing, and hunting.

## Fire as an Exceptional Event

State and federal governments recognize that wildland fire is a natural and often uncontrollable event that creates air pollution. In 1999 the EPA established an “Exceptional Events Rule” (EER) that allowed air district managers to report that their districts’ allowable limits of specific pollutants were caused by pulses of smoke from wildfires. This Exceptional Events Rule recognizes that wildfire is not a human-caused source of pollution and often cannot – and in many cases should not – be controlled.

Unfortunately, this rule, which could have allowed land managers to use more fire, has had limited usefulness for both fire managers and air regulators, for at least two reasons. First, it has been applied inconsistently in different states, and second, it presents such technical difficulties to regulators that they hesitate to use it. Bodies of air are not static entities; smoke can move hundreds of miles from its source in a day. Proving to the EPA that a specific wildfire, as opposed to excessive urban-sourced pollution, caused noncompliance is expensive and time-consuming. Air districts therefore rarely seek to invoke the Exceptional Events Rule.

Congress and the EPA need to recognize that, unlike constant or chronic sources of air pollution that produce regional haze, wildland fires are episodic smoke sources that impact visibility for a limited period of time. The solution for addressing both regional haze problems and excessive “criteria” air pollutants must be reducing urban-industrial air pollution, not limiting fire management programs that may temporarily throw a region out of compliance.



*Fire managers ignite prescribed fires in Yosemite valley. Smoke may spoil the view for a few days, but will preserve the scenic vistas for years to come from overly dense vegetation that would grow in the absence of fire.*

## Smoke as Nuisance

One of the main drivers of regulatory action against smoke from wildland fire is complaints from local residents that smoke is a nuisance. “Nuisance smoke” is not regulated under the federal Clean Air Act unless it reaches concentrations of “criteria pollutants” that violate National Ambient Air Quality Standards. States, however, may have their own nuisance rules. Whether or not wildland smoke violates a regulation, the public and their elected officials may put pressure on air regulators to end it. This can result in air regulators requiring fire managers to cut off their prescribed fires early or to take more aggressive suppression actions on wildfires. Paradoxically, in most cases aggressively suppressing wildfires to eliminate their smoke involves igniting backfires that often produce even greater amounts of smoke. Sometimes these suppression actions can prove dangerous and even deadly. In 2008 nine firefighters died in a northern California helicopter crash while being transported from a remote wilderness blaze. The fire was not threatening any homes or lives; rather, the firefighters were dispatched in large part because of public pressure to reduce nuisance smoke.

Nuisance smoke can admittedly cause health or safety problems. Low visibility because of dense smoke on roadways can cause traffic accidents. Air Quality Specialist Ann Mayo Hobbs of California’s Placer County states the situation this way: “The most sensitive concern regarding prescribed fire is the management of smoke to prevent complaints. Most of the time when a complaint is made, the smoke is [merely] a nuisance. More than likely there has not been a violation of air quality standards. However, this same smoke can cause both health and safety problems in sensitive receptors and populated areas.”



*Wildfire smoke plumes can be dramatic spectacles, but their effects on air quality are infrequent, temporary, and rarely exceed regulatory limits despite their awful appearance.*



Since it is impossible to prevent all wildland fires, and ecologically foolish to try to do so, communities must prepare and implement mitigation plans to provide for smoke-related health and safety needs during fires. Persons sensitive to smoke – “sensitive receptors” such as asthmatics, the young, and the elderly – may need to stay indoors or temporarily leave the area. Just as “cooling centers” are provided during heat waves for those vulnerable to high temperatures, so too public provisions should be made for persons vulnerable to smoke.



*Controlling smoke emissions has become an increasingly popular rationale for aggressive fire suppression actions, but when firefighters ignite huge backfires and burnouts this can produce even more smoke than might have occurred naturally.*

Expansion of human settlements into fire- and smoke-prone wildlands is a major factor in the wildland fire conundrum. Homeowners living near public lands are much more likely to experience fire smoke, and the existence of homes in wildlands is forcing agencies to spend enormous amounts of money and time on fuels reduction and wildfire protection in the wildland urban interface (WUI). Forest Service researchers estimate that 44 million homes in the continental U.S. are located in the WUI. The National Academy for Public Administration predicts that by 2030 there will be a 40% increase in the number of homes in the WUI compared to 2001 levels. The Government Accountability Office estimates that currently 50% to 95% of the Forest Service firefighting budget goes to the WUI. According to a Headwaters Economics study, annual firefighting costs for private property protection alone currently range from \$630 million to \$1.2 billion, and a 50% growth in housing development could raise annual suppression costs up to two to four billion dollars.

Suppression costs could be reduced, and agency expenditures on fuels reduction more efficiently and effectively applied, if more prescribed fire were used in wildlands adjacent to communities. Yet people living in or near the WUI are often the largest source of complaints about smoke. Thus human settlement in the WUI brings air quality concerns closer to fire management areas, with smoke-sensitive persons living in the very areas most needing fire treatments. Fear of flames destroying private property has traditionally dominated public attitudes about fires near communities, but today it is just as likely to be intolerance of smoke.

These public attitudes toward smoke are an enormous hindrance. Many people assume that land managers can stop all wildfires and do not need to conduct prescribed fires. They do not realize that the current low levels of smoke and haze are not the historical norm. The public needs to understand that smoke from wildfires is as natural as snow that prevents travel or pollen that causes allergies. Smoke for those living in or near wildlands is not optional, and its presence must be accepted just as people accept the inconveniences of snow or pollen.



*The sprawl of suburban developments into fire-prone wildlands and the concern of fire managers to limit smoke intrusions into communities have put additional constraints on prescribed burning and the ability of fire managers to utilize wildfire ignitions for ecological benefits.*

## How Fire Managers Reduce Smoke from Wildland Fires

Land managers have three ways of limiting the amount of smoke that affects nearby communities and regional air quality. First, they can perform prescribed fires or allow lightning-caused fires to burn during weather conditions that will loft smoke high in the atmosphere and disperse it away from communities. Second, they can burn when fuels are likely to burn hotter and quicker, using firing techniques that minimize the amount of smoldering. Third, they can use fuels management techniques to reduce or remove fuels from a site before it burns.

Of these approaches, burning during “good ventilation” periods, when weather conditions are the most effective for transporting smoke up and away from smoke-sensitive areas, is the most effective method for managing emissions. This method is widely used and obtains excellent results. However, it is not foolproof: even when ventilation and lifting is good during the day, smoke will often flow downhill at ground level at night, filling canyons and valleys. Many larger managed fires burn over long enough periods of time to see changes in weather conditions, so even if conditions during some periods promote optimal smoke dispersion, changing conditions may move the smoke into populated areas.

Wildland fires produce variable amounts of smoke depending on what is burning, its condition, and atmospheric conditions. In general, the more complete the combustion of fuels, the less smoke is produced. Wet, cold, or tightly-packed fuels produce more smoke than dry, well-ventilated fuels. Forests in an unhealthy condition, such as those with heavy fuels resulting from past fire suppression, bug kill, or logging debris, produce more smoke than those experiencing regularly recurring, low intensity fire. Short-term, heavy-emission fires in such forests will of course lead to much lower emissions when future fires enter the same areas, providing that the initial burning takes place at high enough intensity to consume excessive fuels.

Fire managers using wildfire for multiple objectives rely heavily on weather forecasts, targeting the weather conditions that will achieve the desired ecological results. Smoke dispersion is of course part of their consideration. However, the kinds of weather conditions that enable fire to achieve optimum ecological objectives may not be the same as those which promote maximum smoke dispersion. For example, a fire prescription to promote certain sensitive species may call for low flame heights and relatively “cool” burning – conditions which generally do not promote good smoke dispersion. Such situations can put ecosystem restoration needs in conflict with air quality goals.

Methods of burning called “pretreatments” can also mitigate smoke emissions. Pile burning can concentrate fuels and heat and reduce emissions compared with broadcast (generalized) burning of the same fuels. Ignition techniques such as backing fire down slopes or doing rapid aerial ignitions to build up heat in a burn unit can also reduce emissions.

Fire and fuel managers can employ a variety of techniques before, during, and after prescribed burns or managed wildfires to mitigate the amount or spread of smoke, and all of these options are part of the formal Smoke Management Plans that managers submit to air quality regulators. The most critical need is public support for proactive fire and fuels management, knowing that there can be no fire without some smoke.

## **Fuel Management**

Another way to manage smoke emissions is to reduce or remove fuels before they burn. It is estimated that between 39 and 190 million acres of public lands have missed fire cycles due to past suppression efforts. Some of these areas may require treatment to deal with excessive fuels that have accumulated from this fire deficit. Treatment costs vary from as low as \$45 per acre for prescribed burning to \$2,000 or more per acre for mechanical treatments like thinning. Prescribed fire costs are much higher in populated areas due to the need for additional equipment and personnel to safeguard homes. In some WUI areas fire is simply impossible, and mechanical treatments are the only option.

Different agencies and lands have different mandates and options for managing fire, fuels, and smoke. The U.S. Forest Service manages much of its land for “multiple use” commodity resource extraction through livestock grazing or commercial logging, and has developed an extensive road network to support these. The Forest Service can thus use heavy equipment to remove biomass from its lands prior to planned burns either through firewood sales, commercial and pre-commercial thinning operations, or chipping and masticating woody materials. These mechanical treatments, however, can cause significant negative impacts to soil and water quality, and the vehicles and equipment involved produce carbon emissions. Such efforts to reduce smoke emissions, therefore, generally involve tradeoffs in the form of higher treatment costs and environmental impacts.

The National Park Service (NPS) has a different set of options than does the Forest Service in terms of smoke management planning, given the Park Service’s mandate to preserve naturally functioning ecosystems. With large areas of roadless land in near-wilderness or official wilderness condition, the NPS rarely uses mechanical or commercial wood removal. Instead, its managers conduct large prescribed burns and allow lightning-caused fires in backcountry areas to run their natural course with monitoring. The NPS does conduct some non-fire treatments where the use of fire is too risky or public safety concerns are high.

Mechanical treatments, contrary to popular misconception, cannot prevent wildfire or substitute for prescribed fire as an entirely “smoke-free” solution to fuels management. Mechanical methods are impossible in steep or rugged terrain, cannot be used in designated wilderness areas, are not economically feasible at the scale of acreage that needs to be treated, and can actually increase fire danger. In addition, mechanical treatments do not mimic fire in terms of their important ecological effects. Research has repeatedly shown that, to effectively accomplish both fuels reduction and ecosystem restoration goals, thinning or other mechanical work must be followed by burning, which will produce smoke.

## Conclusion

Wildland fires and the smoke they produce are natural parts of the ecosystem, but the historic fire deficit has caused many people to forget the vital role played by fire and smoke in regenerating plants, recycling soil nutrients, reducing insect and disease outbreaks, and renewing ecosystems. Although more people now are realizing the many social and ecological benefits of wildland fire, smoke can be unhealthy to some especially smoke-sensitive persons, and is generally unpleasant and unwanted by all others. Just like winter snowstorms or spring pollen, smoky skies and hazy horizons are some of the inevitable tradeoffs that people must accept in order to enjoy the scenic, recreational, and economic benefits of living near fire-prone western wildlands. No one understands these tradeoffs more than wildland firefighters and fire managers whose lungs are literally on the frontlines! But fire management professionals know that fire is needed, and that inevitably means tolerating the smoke from fires.



*Wildland firefighters are the people most impacted by smoke emissions, but they tolerate smoke because they understand the positive economic and ecological benefits of fire, and know that active fire management is the best means of limiting smoke emissions.*

Fire managers face enormous challenges in restoring landscapes that have been degraded by past overzealous fire suppression, and public intolerance to smoke is fast becoming an impediment to both prescribed and wildland fires. Ironically, steps to prevent smoke often result in the opposite intended outcome, as in the case of firefighters aggressively suppressing wildfires through large-scale backburning that emits even more smoke than the wildfire itself. At times, too, managers are unable to perform prescribed burns when conditions favor smoke dispersion, and the same area will later burn from a wildfire during conditions that send the smoke spewing into local communities. The public must realize and accept that there is no viable or sustainable way to absolutely exclude or eliminate wildland fires and the smoke they produce. The best way to mitigate smoke emissions is through proactive fire management – which inherently involves smoke management.

Wildland fire smoke is not a “problem” that can or should be prevented; rather, urban-industrial-agricultural sources of air pollution are the problem that can and must be restricted. All smoke is not created equal: human-caused sources of air pollution are chronic and/or constant sources of pollutants, unlike wildfires or prescribed fires that are temporary and episodic in nature. Air regulators need to strongly enforce the Clean Air Act to protect public health from industrial and human-preventable sources of air pollution, but it is not right to impose the same regulations on wildland fires.

When air regulators force fire managers to avoid or shut down prescribed fires or aggressively suppress and extinguish wildfires, air quality may be temporarily “protected.” But this occurs at the long-term expense of other necessary environmental and social goals such as ecosystem health and sustainability or community wildfire protection. In essence, we need to keep restricting and reducing urban-industrial-agricultural smoke emissions so the atmosphere can absorb wildland fire smoke emissions with minimal impacts to human health and comfort.



*At times wildfire smoke can enhance nature's beauty, producing crimson-red sunsets or filtering golden sunbeams through darkened clouds.*

### **FUSEE Recommends:**

1. Congress must recognize the inevitability of increasing wildland smoke and the growing conflict between fire/fuels management and air quality regulations. Efforts to maintain public health and reduce regional haze from industrial sources must not be weakened. But wildland forest smoke, a natural occurrence, must be taken out of the regulatory mix in order for land managers to achieve ecological restoration on federal lands and public safety goals.
2. Greatly increased public education regarding the need for fire on public lands is needed. Since many calls to squelch managed fires result from nuisance complaints from the public, strong efforts to help the public understand the role of fire in regaining healthy forest ecosystems is needed. The value of prescribed fire to help protect human communities must also be stressed. The public must come to understand that avoiding smoke today likely means gaining more smoke in the future. Patience is called for in the interest of the greater good.
3. The Clean Air Act 40 CFR parts 50 and 51 must be amended to reflect inevitable increasing smoke levels from wildland fires, given both the need to restore forests with fire and the realities of climate change. Currently the Clean Air Act allows state and regional air regulators to recognize wildfire as the source of elevated pollution through the "Exceptional Events Rule." The Act must be changed to expand the applicability of the EER to both prescribed fire and multiple objective wildfires. Further, the EER must be applied consistently in all states. Finally, the technical requirements for invoking the EER must be simplified so it can be easily employed by local air district managers.

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## **About Firefighters United for Safety, Ethics, and Ecology (FUSEE):**

FUSEE (pronounced FEW-zee) is a national nonprofit organization founded in 2004 that is dedicated to public education and policy advocacy to promote safe, ethical, and ecological fire management. FUSEE members include current and former wildland firefighters, other fire management workers, fire researchers and educators, forest conservationists, rural homeowners, and other interested citizens. A “fusee” is a quick-igniting, handheld torch used by firefighters to secure firelines, create safety zones, reduce hazardous fuel loads, and restore fire-adapted ecosystems. FUSEE informs, inspires, and empowers firefighters and their citizen supporters to become *torchbearers for a new paradigm in fire management*.

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*On the Cover: Smoke from these lightning-caused fires in Yellowstone National Park is actively monitored by fire managers so fire can continue playing its role in maintaining ecological health and the wilderness values that Americans cherish.*

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