

Only Congress Can Prevent Forest Fires: A Comment on Prescribed and Natural Fire Programs and the Clean Air Act

When the forty-niners poured over the Sierra Nevada into California, those that kept diaries spoke almost to a man of the wide-spaced columns of mature trees that grew on the lower western slope in gigantic magnificence. The ground was a grass parkland, in springtime carpeted with wildflowers. Deer and bears were abundant. Today much of the west slope is a dog-hair thicket of young pines, white fir, incense cedar, and mature brush—a direct function of overprotection from natural ground fires. With the four national parks—Lassen, Yosemite, Sequoia, and Kings Canyon—the thickets are even more impenetrable than elsewhere. Not only is this accumulation of fuel dangerous to the giant sequoias and other mature trees but the animal life is meager, wildflowers are sparse, and to some at least the vegetative tangle is depressing, not uplifting. Is it possible that the primitive open forest could be restored, at least on a local scale? And if so, how?

Committee advising the Secretary of the Interior (1963)¹

If you don't create them [fires] in our time frame on our scale, Mother Nature will provide them for us, and it may be on a scale and time frame we don't like.

Charles G. Johnson, Jr., U.S. Forest Service²

We've got to bring Smokey back with a different message.

Jim Agee, Ph.D., University of Washington³

¹ Starker, Cain, Cottam, Gabrielson and Kimball, *Wildlife Management In The National Parks*, TRANSACTIONS: 28TH NORTH AMERICAN WILDLIFE AND NATURAL RESOURCES CONFERENCE; 1963, Washington, D.C., Wildlife Management Institute, 1, 18.

² Quoted in *Fire Prescribed to Cure Ailing Forest*, L.A. TIMES, Nov. 17, 1991, at B3.

³ Bill Dietrich, *Burn, baby, burn*, SEATTLE TIMES, Mar. 29, 1992, at B7.

INTRODUCTION

In its current form, implementation of the 1990 Amendments to the Clean Air Act ("the Act")⁴ will reduce and may even eliminate the beneficial uses of prescribed and natural fire programs in the United States. Local, state, and federal agencies responsible for air quality standards must balance the Act's objectives with those of land managers whose job is to protect range and timber lands. Congress needs to re-visit the Act to include provisions which recognize the necessary role of fire in the maintenance of a healthy ecosystem.

Traditionally, fire played a vital role in the protection and regeneration of woodlands in the western United States. Native Americans recognized that surface fires promoted healthy oak growth.⁵ They used fire to keep meadows open to produce food and materials. Ranchers used fire as a management tool to control the rangeland's perennial grasses.⁶ Early foresters used surface fire to keep forests clear of undergrowth and safe from devastating wildfires.⁷

Today, many of these traditional practices are preserved in the policies which support prudent forest management.⁸ Prescribed and natural fires⁹ are recognized for achieving three land management objectives: 1) the reduction of forest fuels which intensify the destructiveness of wildfires; 2) the creation of open, sunny growing conditions for the propagation of vital timber species;¹⁰ and 3) the cost-efficient reduction of timber and grass waste for both the timber and agricultural

⁴ 42 U.S.C.S. §§ 7401-7671(q) (Law. Co-op. 1989 & Supp. 1992).

⁵ STEPHEN PYNE, *FIRE IN AMERICA* 38 (1982).

⁶ Harold Biswell, *Prescribed Fire as a Management Tool*, SYMPOSIUM: ENVIRONMENTAL CONSEQUENCES OF FIRE AND FUEL MANAGEMENT IN MEDITERRANEAN ECOSYSTEMS 152 (Aug. 1-5, 1977).

⁷ A wildfire is any fire that is not prescribed. Natural fires are those started from natural causes. PYNE, *supra* note 5, at 4.

⁸ FOREST SERVICE SOUTHERN REGION, U.S. DEP'T OF AGRICULTURE, *A GUIDE FOR PRESCRIBED FIRE IN SOUTHERN FORESTS* 2, (Feb. 1989) [hereinafter *A GUIDE FOR PRESCRIBED FIRE*]. "Most land management agencies today recognize the importance of fire to wildland organisms, including the need to have fires that support development. But we are constrained in its use by lack of funds and environmental restrictions." Robert E. Martin, *What California Can Do To Dampen the Fire Season*, S.F. CHRON., July 16, 1990.

⁹ Prescribed burning of forest lands has been aptly defined as, "The controlled application of fire to wildland fuels in either a natural or modified state, under specific environmental conditions which allow the fire to be confined to a predetermined area and at the same time produce the intensity required to attain planned resource management of objectives." *A GUIDE FOR PRESCRIBED FIRE*, *supra* note 8, at 52.

¹⁰ PYNE, *supra* note 5, at 45.

industries.¹¹

Increasingly, the recognized uses of fire have come into conflict with the public's concern over air quality. When applied, the mandates imposed by the 1990 Amendments to the Act threaten to eliminate the use of fire as a land management tool. Additionally, the urbanization of rural areas has inhibited the useful application of prescribed and natural fire regimes.¹²

Clean air is one mandate among many which represent the proper stewardship of the earth's ecological systems. Often, in the rush to address problems of enormous scientific and political consequence, Congress enacts legislation which fails to strike a balance with competing (but compatible) policy objectives. The failure of the Act to account for the use of prescribed use of fire is indicative of one such shortcoming.

With the Clean Air Act, Congress started the process of returning our air to livable standards. However, the mandates of the Act cripple a spectrum of human activities whose perceived benefits no longer outweigh their known detriments. In forest and rangelands, fire is a different creature. Properly administrated, it restores as it destroys, rejuvenates as it burns. As this Comment will show, if the Clean Air Act is enforced without recognizing the value of this practice, land managers will lose a tool which has become essential in the maintenance of our ecosystem.

This Comment is organized into five sections. Section I summarizes the Clean Air Act and the pertinent provisions relating to air-borne pollutants. Section II discusses the essential role of fire in the protection of forest and rangeland. Section III examines the current effort by land managers to balance conflicting policies concerning fire and air quality. Section IV suggests legislative and regulatory changes to the Act to permit the continued use of prescribed fire without sacrificing public health. Section V contains concluding remarks.

¹¹ A GUIDE FOR PRESCRIBED FIRE, *supra* note 8, at 2.

¹² Russell Robert, *Air Quality Mandates and the Opportunity They Create to Utilize Biomass as an Alternative Fuel Treatment*, PROTECTING AND MAINTAINING A HEALTHY FOREST CONFERENCE, Redding, California, 3 (July 8, 1992); Robert W. Mutch, *Successful Prescribed Fire Programs in Forests*, PORTLAND FIRE CONFERENCE, 3 (Jan. 1992).

I. THE CLEAN AIR ACT WAS DESIGNED TO PROTECT THE PUBLIC FROM UNSAFE CONCENTRATIONS OF POLLUTANTS, INCLUDING THE RELEASE OF SMOKE PARTICLES AND GASES FROM FIRE

The increased use of motor vehicles and the resulting air pollution throughout the United States, as well as the rising demand for energy derived from sulfur-bearing fuels, led the Eighty-Seventh Congress to pass the Clean Air Act of 1963.¹³ The 1963 Act authorized the Department of Health, Education and Welfare ("HEW") to establish air quality standards which were not mandatory on the states.

The 1967 Amendments¹⁴ to the Act required that states designate air quality control regions with ambient air quality standards.¹⁵ The implementation and enforcement of air quality standards was based on state regulations,¹⁶ with guidance provided by the Department of Health, Education and Welfare. Neither the 1963 Act nor the 1967 Amendments established federal minimum standards nor provided for federal enforcement should the states fail to comply with the Act's broad mandates.

Thus, in its infancy, the Act construed clean air standards in the context of individual state criteria and enforcement. This emphasis was the result of two, not entirely reconcilable, factors. One, different states would set different standards based on their own public health and economic policies. Two, Congress knew that the Department of Health, Education and Welfare was ill-equipped to enforce federal standards throughout the 50 states.¹⁷

The omission of a unified emission and pollutant standard, and the inconsistencies expressed by the states' own practices, lead to worsening

¹³ Clean Air Act of 1963, Pub. L. No. 88-206, 77 Stat. 392 (1963); (Current version at 42 U.S.C.S. §§ 7401-7671(q) (Law. Co-op. 1989 & Supp. 1992)).

¹⁴ Air Quality Act of 1967, Pub. L. No. 90-148, 81 Stat. 465 (1967); (Current version at 42 U.S.C.S. §§ 7401-7671(q) (Law. Co-op. 1989 & Supp. 1992)).

¹⁵ "Ambient air" means "that portion of the atmosphere, external to buildings, to which the general public has access." 40 C.F.R. § 50.1(e) (Law. Co-op. 1989 & Supp. 1992). See also *Train v. N.R.D.C.* (1975) 421 U.S. 60, 63-68 for a good discussion of the National Ambient Air Quality Standards.

¹⁶ The state regulations were contained in state implementation plans which were developed to accomplish the required air quality criteria. Under the Act, state implementation plans are required to demonstrate how the state intends to meet the obligatory levels of pollutants as stated in the National Air Quality Standards. ENVIRONMENTAL LAW REPORTER, ENVIRONMENTAL LAW INSTITUTE, CLEAN AIR DESKBOOK 16 (1992) [hereinafter CLEAN AIR DESKBOOK].

¹⁷ *Id.* at 7.

air quality throughout the United States.¹⁸ This problem was exacerbated by the inherent quality of air to ignore state boundaries, creating conflict between more environmentally conscious states and those with serious pollution problems.

The 1970 Clean Air Act¹⁹ discarded the legislative plan for individual state standards in favor of federal standards for motor vehicles and fuels, hazardous air pollutants, stratospheric ozone, and acid rain. Furthermore, the Amendments authorized the United States Environmental Protection Agency ("EPA") to establish deadlines for individual state implementation plans.²⁰

State participation was not eviscerated from the law concerning air quality. The 1970 Amendments envisioned a joint federal and state effort in which states could adopt their own plans for reaching the emission standards established by the Act.²¹ However, Congress developed deadlines for the effectuation of the individual plans and granted the EPA broad enforcement powers.

Because the 1975 deadline in the 1970 Amendment proved too ambitious, the deadline for individual state implementation plans was postponed by the 1977 Amendments.²² Thus, states had until 1987 to bring their nonattainment areas²³ into substantial compliance with the National Ambient Air Quality Standards ("NAAQS"). With its 1977 Amendments, Congress established new state plans, involving the adoption of permit programs for the construction of new emissions' sources. It further delayed attainment area compliance until 1982; nonattainment until 1987.

¹⁸ *Id.*

¹⁹ Clean Air Act Amendments of 1970, Pub. L. No. 91-604, 84 Stat. 1676 (1970); (current version of 42 U.S.C.S. §§ 7401-7671(q) (Law. Co-op. 1989 & Supp. 1992)).

²⁰ CLEAN AIR DESKBOOK, *supra* note 16, at 16.

²¹ Bethlehem Steel v. Gorsutch, 752 F.2d 1028, 1037 (7th Cir. 1984); H.R. REP. NO. 490, 101st Cong., 2d Sess. 145 (1990), *reprinted in* 1990 U.S.C.C.A.N 3530.

²² Clean Air Act Amendments of 1977, Pub. L. No. 95-95, 91 Stat. 685 (1977); (current version at 42 U.S.C.S. §§ 7401-7671(q) (Law. Co-op. 1989 & Supp. 1992)).

²³ A nonattainment area is one that has not achieved the ambient air quality standards as set forth in the SIP which encompasses that region. CLEAN AIR DESKBOOK, *supra* note 16, at 21.

A. *The Clean Air Act Utilizes a Regulatory Scheme Which Classifies Types of Pollutants and Acceptable Levels of Particulates, but Improperly Equates Prescribed Fire to a Man-made Pollution Source*

Historically, the Act was viewed as an urban act that focused on problems stemming from vehicle pollution, as well as hazardous and toxic substances. Rural areas with low population density had little problem complying with air quality regulations.²⁴ Over time, though, the increase in urban area noncompliance and the spread of urban pollutants rendered the urban-rural distinction of little relevance to the Act's regulatory scheme of the Clean Air Act.²⁵

Thus, the 1990 Amendments to the Act divided nonattainment areas into categories depending on the severity of their pollution problem.²⁶ The deadline for achieving control of an area's designated air quality was determined by the level of nonattainment.²⁷ Attainment areas were required to adopt at least minimal moderate nonattainment standards if they became polluted by out-of-area sources.²⁸

One category affecting nonattainment areas is small particulate matter (or PM-10), which includes the emissions from fire.²⁹ To declare an area nonattainment for PM-10, a Federal Register notice must be filed which designates the area as either moderate or serious for small particulate pollution.³⁰ If an area cannot "practicably" meet the standards set for PM-10 by December 31, 1994, it is classified as serious. Serious nonattainment areas are required to attain the federal quality standard for PM-10 before December 31, 2001.³¹

Beneficial use of fire conflicts with the Clean Air Act's PM-10 guidelines beginning with the definition of man-made (anthropogenic) and natural (non-anthropogenic) sources.³² Congress broadly defined

²⁴ *Id.*

²⁵ "[T]he public health concerns of smoke in urban areas is dictating that we define areas and conditions where the use of prescribed fire is appropriate and identify alternative treatment strategies where it's not." Letter from California Air Pollution Control Officers Association to Ron Stewart, Regional Forester, USDA Forest Service (Jan. 24, 1992).

²⁶ CLEAN AIR DESKBOOK, *supra* note 16, at 23.

²⁷ 42 U.S.C.S. § 7511(a)(1) (Law. Co-op. 1989 & Supp. 1992).

²⁸ CLEAN AIR DESKBOOK, *supra* note 16, at 27 n.79.

²⁹ 42 U.S.C.S. § 7513 (Law. Co-op. 1989 & Supp. 1990).

³⁰ *Id.* at § 7513(a).

³¹ *Id.* at § 7513(c)(2).

³² 42 U.S.C.S. § 7491(g)(3) (Law. Co-op. 1989 & Supp. 1992).

anthropogenic sources to include pollutants such as industrial and mobile sources.³³ The Act deems dust blown from dry lake beds resulting from water diversion to be an anthropogenic source.³⁴ Some district air pollution officials consider fires started by lightning strikes within prescribed fire zones to be an anthropogenic source.³⁵

As a review of PM-10 guidelines shows, the utilization of prescribed fire in land management practice was misunderstood by the drafters of the Clean Air Act. The federal standards within nonattainment areas tolerate certain anthropogenic sources of small particulate pollution. On a case-by-case basis, the EPA may waive a deadline for compliance if it determines that an anthropogenic source of particulates is not a significant problem within a given area.³⁶ Certain natural sources, such as volcanic eruptions and uncontrolled wildfires, may also be waived, even if their effect is considered more serious.³⁷

Nevertheless, the Act fails to purposefully differentiate between prescribed fires, human set fires, and ones naturally ignited. Thus, the Act's stringent nonattainment standards do not acknowledge that emissions from man-made fires may produce less air pollution than the results of natural uncontrolled wildfires.

Research from individual states confirms the importance of adopting a different classification for prescribed fires. It has been shown that prescribed burning accounts for a very small percentage of total PM-10 emissions. For example, in California's Sacramento Valley, agricultural burning is estimated to account for only 2 percent of the total PM-10 emissions, largely coming from burning rice fields.³⁸ An Oregon Department of Environmental Quality study of nonattainment violations within the state shows that prescribed burning accounted for less than 4 percent of total PM-10 pollution; with woodstove smoke and industrial

³³ See H.R. REP. NO. 490, 101st Cong., 2d Sess. 265-66 (1990), *reprinted in* 1990 U.S.C.C.A.N. 3530, 3649-50.

³⁴ *Id.*

³⁵ Letter from Edward Hale, Air Pollution Control Officer, Siskiyou County, State of California to B. Smith, Regional Forester, USDA Forest Service (July 7, 1987) (on file with author).

³⁶ 42 U.S.C.S. § 7513(f) (Law. Co-op. 1989 & Supp. 1992).

³⁷ Telephone interview with Eric Ginsburg, Deputy Director, Air Quality Management Division, Environmental Protection Agency, Triangle Park, North Carolina (July 17, 1992).

³⁸ OFFICE OF AIR AND RADIATION, U.S. ENVIRONMENTAL PROTECTION AGENCY, *PRESCRIBED BURNING BACKGROUND DOCUMENT AND TECHNICAL INFORMATION DOCUMENT FOR BEST AVAILABLE CONTROL MEASURES*, 2-19 (Sept. 1992) [hereinafter *PRESCRIBED BURNING DOCUMENT*].

sources being the major sources of emissions.³⁹ Montana is also performing source apportionment studies to determine the contribution of prescribed burning to PM-10 concentrations. Preliminary results suggest that its conclusions will confirm the PM-10 data from other states, that prescribed burning accounts for only a very small percentage of PM-10 emissions.⁴⁰

The Clean Air Act adopts certain categories of pollutants which utilize an unreliable framework of man-made versus natural pollution sources. Accordingly, the Act excuses unpredictable wildfires, whose impact on air quality can be enormous (but which are nonanthropogenic), while alternatively punishing man-made controlled fires, whose PM-10 contribution is often negligible. This fact has not escaped land managers: "It is not the primary intent of the Clean Air Act to manage the impacts from natural sources of impairment (i.e., prescribed natural fires)."⁴¹ Ironically, the prudent use of prescribed fires can reduce the very underbrush and dead timber that results in wildfires, thereby decreasing overall pollutant emissions.⁴²

B. The Latest Effort by the EPA to Redress the Inequitable Treatment of Prescribed Fire in the Clean Air Act Perpetuates the Law's Bias Against Controlled Burning

Recently, Congress tried to remedy the Act's treatment of prescribed fire as an anthropogenic source.⁴³ The 1990 Amendments required the EPA to promulgate guidelines for the states which specifically included "prescribed silvicultural and agricultural burning" procedures.⁴⁴ The guidelines were the work of a task force of state and federal agencies, including the National Wildfire Coordinating Group's Prescribed Fire and Fire Effects Working Team, the Western Resource Council, and the National Association of State Foresters. These guidelines were issued in September, 1992.⁴⁵

³⁹ *Id.* at 2-24.

⁴⁰ Telephone interview with Bob Reisch, Montana Air Quality Bureau, Hebun, Montana (Feb. 26, 1993).

⁴¹ NATIONAL PARK SERVICE, U.S. DEP'T OF THE INTERIOR, FIRE MANAGEMENT PLAN YELLOWSTONE NATIONAL PARK 2 (1992) [hereinafter YELLOWSTONE FIRE MANAGEMENT PLAN].

⁴² GENERAL ACCOUNTING OFFICE, FEDERAL FIRE MANAGEMENT PLAN 3 [hereinafter FEDERAL FIRE MANAGEMENT PLAN] (GAO/RCED-91-42).

⁴³ 42 U.S.C.S. § 7513(b) (Law. Co-op. 1989 & Supp. 1992).

⁴⁴ *Id.*; Silviculture is the art of cultivating a forest. WEBSTER'S NINTH NEW COLLEGIATE DICTIONARY 1098 (1990).

⁴⁵ PRESCRIBED BURNING DOCUMENT, *supra* note 38, at 1-6.

The report recognizes that unlike most sources of air pollution, such as smoke stacks or urban vehicle traffic, prescribed burning is unique.⁴⁶ For instance, a prescribed fire set on a northern slope in spring has different emission characteristics than one set on a southern slope in summer. Despite such recognition, the EPA's new regulations fail to balance the benefits of prescribed fire against the broad mandate of better air quality. Instead, the report provides an extensive review of smoke management programs,⁴⁷ the means used to determine compliance with PM-10 standards,⁴⁸ and methods for reducing emissions from prescribed burning.⁴⁹

Ultimately, the report recommended reducing the pollution from fire. The task force failed to integrate current fire management practice into its program. The new regulations for PM-10 concentration in nonattainment areas do not differentiate between forest, rangeland and agricultural burning. Making this distinction would have forced the task group to focus on the discrete advantages of prescribed fire within individualized attainment and nonattainment areas by recognizing that fire plays different roles in individualized ecosystems.⁵⁰ Because the emphasis is on clean air rather than a healthy environment, the report misses an opportunity to rectify an historic imbalance in federal ecological policy.

C. *The Clean Air Act Provides for Enforcement of These Standards by State and Local Air Regulatory Agencies*

The primary means of enforcing the Act is through state implementation plans.⁵¹ Should a state fail to comply with its approved state plans, the EPA is authorized to commence a civil action for the violation and collect penalties up to \$25,000 per day.⁵² Additionally, injunctive relief may be obtained.⁵³ A good faith effort to comply⁵⁴ and/or the technological unfeasibility of meeting the state implementation plan re-

⁴⁶ *Id.*

⁴⁷ *Id.* at Chapter 3.

⁴⁸ *Id.* at Chapter 7.

⁴⁹ *Id.* at Chapter 9.

⁵⁰ Telephone interview with Tom Nichols, Prescribed Fire Specialist, West Region, National Park Service, and Trent Proctor, Air Resource Specialist, Western Region, USDA (July 15, 1992).

⁵¹ 42 U.S.C.S. § 7410(a)(2)(C) (Law. Co-op. 1989 & Supp. 1992), *see also* CLEAN AIR DESKBOOK, *supra* note 16, at 14.

⁵² 42 U.S.C.S. § 7413(b) (Law. Co-op. 1989 & Supp. 1992).

⁵³ *Id.*

⁵⁴ *Id.*

quirements are not sufficient defenses to an EPA suit.⁵⁵

The 1990 Amendments contain broad civil and criminal penalties for intentional violations of a state implementation plan requirement or administrative order.⁵⁶ The Act contains no provision for a "grace period" to allow continuation of a violation, including a prescribed fire operation, during which time the violator might seek to correct the violation or justify the benefit of the burn.⁵⁷ While the 1992 conference report encourages the EPA to use prosecutorial discretion and not to pursue de minimis or technical violations of the Act,⁵⁸ this hardly equates to the type of notice which states require to avoid substantial civil and criminal penalties set forth by the Act.

The 1990 Amendments also give enforcement authority to local agencies.⁵⁹ The activities of federal land managers whose territory crosses air districts and state lines are subject to local controls.⁶⁰ The local air district can levy fees from land management agencies to cover monitoring costs.⁶¹ It can require monitoring by these agencies not provided for within their budgets. In some instances, such costs have become so high as to prohibit logging on federal lands or prescribed burning by the United States Forestry Service.⁶²

Although waivers are available to exempt certain fires from nonattainment compliance,⁶³ the advance time required can cause land man-

⁵⁵ *United States v. Vanguard Corp.*, 701 F. Supp. 390 (1988); see *Union Electric Co. v. EPA*, 427 U.S. 246 (1976).

⁵⁶ 42 U.S.C.S. § 7413(c) (Law. Co-op. 1989 & Supp. 1992).

⁵⁷ CLEAN AIR DESKBOOK, *supra* note 16, at 73.

⁵⁸ H.R. REP. NO. 952, 101st Cong., 2d Sess. 348 (1990), *reprinted in* 1990 U.S.C.C.A.N. 3731.

⁵⁹ 42 U.S.C.S. § 7418 (Law. Co-op. 1989 & Supp. 1992).

⁶⁰ *Id.*; Local control is particularly strong under the Clean Air Act. In California, for example, the Supreme Court has recognized the authority of county and regional districts to regulate all non-vehicle sources of air pollution. *Western Oil and Gas Ass'n v. Monterey Bay Unified Air Pollution Control Dist.*, 49 Cal. 3d 408, 777 P.2d 157, 261 Cal. Rptr. 384 (1989).

⁶¹ 42 U.S.C.S. § 7418(a)(A) (Law. Co-op. 1989 & Supp. 1992).

⁶² Interview with Judith Rocchio, Sierra Zone Resource Specialist, Stanislaus National Forest (July 17, 1992).

⁶³

The Administrator may, on a case-by-case basis, waive any requirement applicable to any Serious Area under this subpart where the Administrator determines that anthropogenic sources of PM-10 do not contribute significantly to the violation of the PM-10 standard in the area. The Administrator may also waive a specific date for attainment of the standard where the Administrator determines that nonanthropogenic sources of PM-10 contribute significantly to the violation of the PM-10 standard in

agers to miss vital opportunities, especially where they elect not to suppress naturally ignited fires.⁶⁴ The expense required to "know before a fire starts what the smoke dispersal conditions" are in a remote area or to have "accurate current ambient air quality data"⁶⁵ for a 700,000 acre forest effectively nullifies the controlled use of a natural fire prior to its occurrence.⁶⁶

One immediate result of Congress' refusal to adopt a separate classification for man-made and non-suppressed natural fires is the inconsistent enforcement which results among air pollution control officers. For instance, in Siskiyou County, California, one air pollution officer interprets the Act to require the Forest Service to suppress all lightning-ignited fires, even those the Forest Service would prefer to allow to burn out naturally.⁶⁷ Moreover, this is perceived to be enforceable even when the funding and personnel to combat the fire are unavailable.⁶⁸

II. FIRE PLAYS AN ESSENTIAL ROLE IN CREATING AND MAINTAINING HEALTHY FOREST AND RANGE ECOSYSTEMS

A. Fire Is Important in Soil Formation, Litter Reduction, and Seed Propagation, as Well as in Other Facets of Forest and Range Productivity

The relationship between fire, on the one hand, and forest and range ecosystems on the other, is complex. Fire is an important component to decomposition of biomass by reducing litter and releasing necessary organic and inorganic chemicals into the ecosystem.⁶⁹

Under natural conditions, the intensity and frequency of fire vary with the amount and rate of accumulation of litter. The greater the litter, the more frequent the fire.⁷⁰ In the western United States, where the rate of growth exceeds the rate of biochemical decomposition, fire is necessary for the release of essential nutrients for the survival and

the area.

42 U.S.C.S. § 7513(f) (Law. Co-op. 1989 & Supp. 1992).

⁶⁴ Proctor, *supra* note 50.

⁶⁵ Letter from Russell Robert, Air Pollution Control Officer, Northern Sierra Air Quality Management District to Tom Nichols, Prescribed Fire Specialist, West Region, National Park Service, (May 12, 1992) (on file with author).

⁶⁶ Proctor, *supra* note 50.

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ PYNE, *supra* note 5, at 35.

⁷⁰ *Id.*

growth of trees.⁷¹ Fire also releases necessary chemical compounds into the soil and drives off unwanted insects, flora, and fauna.⁷² The heat from fire kills some organisms, consumes others, and reshapes the microclimate by increasing sunlight, wind, and nutrient enriched soil.⁷³

Many species of plants, such as the giant Sequoias, adapt specifically to fire regimes, by requiring sunny, mineral-laden soil for germination.⁷⁴ Cones from Knobcone and Lodgepole pines rapidly open and release their seeds when heated by fire.⁷⁵ The open, sunny conditions created by fire benefit the Ponderosa pine in its successional struggle over the Incense cedar, which prefers the deep shade of a dense forest.⁷⁶

Ash discharge into the air can retard airborne parasites, such as mistletoe.⁷⁷ The less dense forest of natural fire regimes is more tolerant to periodic drought and therefore less susceptible to insect infestation.⁷⁸ Researchers have even suggested that carbonaceous components of smoke may help clean the air of undesirable compounds and keep it free of toxic gasses, including certain industrial pollutants.⁷⁹

This oxymoronic role played by pollutants from fire is further illustrated by the fact that burning wood adds to the "greenhouse" effect while it regenerates the forest ecosystem and provides for more rapid reforestation, leading to lower carbon dioxide levels.⁸⁰

⁷¹ *Id.* at 35.

⁷² NATIONAL PARK SERVICE, U.S. DEP'T OF THE INTERIOR, FIRE MANAGEMENT PLAN YOSEMITE NATIONAL PARK 2 (1990) [hereinafter YOSEMITE FIRE MANAGEMENT PLAN].

⁷³ PYNE, *supra* note 5, at 636.

⁷⁴ YOSEMITE FIRE MANAGEMENT PLAN, *supra* note 72, at 17.

⁷⁵ *Id.*

⁷⁶ *Id.* at 18.

⁷⁷ PYNE, *supra* note 5, at 36.

⁷⁸ Interview with Michael Elson Ross, Naturalist/Entomologist, El Portal, California (Nov. 11, 1992).

⁷⁹ R.G. Vines, *Fire's Effect on the Atmosphere*, Symposium, ENVIRONMENTAL CONSEQUENCES OF FIRE & FUEL MANAGEMENT IN MEDITERRANEAN ECOSYSTEMS, Palo Alto, California 31 (Aug. 1-5, 1977).

⁸⁰ The "greenhouse effect" is the relationship of heat from sunlight at the earth's surface caused by atmospheric carbon dioxide that admits a short-wave radiation but absorbs the long-wave radiation emitted by the earth. WEBSTER'S NINTH NEW COLLEGIATE DICTIONARY 536 (1990).

B. Historically, Fire Was Effectively Used by Native Americans and Ranchers to Manage Their Lands

Native American people used fire as a management tool in all areas of the United States.⁸¹ An early description by New England pioneers states that "there is no underwood, saving in swamps and low grounds that are wet . . . for it being the custom of the Indians to burn the woods in November."⁸² The Choctaw, Pawnees and Navajo peoples, and particularly those tribes of the Great Plains, used fire to maintain the grasslands.

By eliminating the previous year's growth and excessive ground mulch, fire allows the sun to warm the earth more quickly with the result not only that, in spring, growth comes weeks earlier, but also that yields are significantly higher from March to July, exactly the period when the [tribe] needed the grass.⁸³

The Native Californians also made extensive use of fire to culture basket materials, control the growth of seed-producing grasses, and facilitate hunting.⁸⁴ The practice of burning was universally used in California's grassland, woodlands, chaparral, and coniferous forests.⁸⁵

Ranchers and pioneers continued the practices of Native Americans by recognizing the importance of natural fire in maintaining open forests for hunting and grazing.⁸⁶ An early traveler on the Oregon Trail recorded that his party could easily drive the wagons through the ponderosa pine forests as they were free of brush and small trees:

Our road has been early the whole day through the woods-that is, if beautiful groves of pine trees can be called woods. The country all through is burnt over, so often there is not the least underbrush, but the grass grows thick and beautiful.⁸⁷

So prevalent was the use of fire by ranchers that the California Department of Forestry began issuing control burning permits for brush

⁸¹ PYNE, *supra* note 5.

⁸² Thompson and Smith, *The Forest Primeval in the Northeast [:] A Great Myth*, TALLTIMBERS FIRE ECOLOGY CONFERENCE, 204 (1978) quoting WOOD, NEW ENGLAND PROSPECTS (1634).

⁸³ Cockburn, *Critique of the Smithsonian Exhibition: The West As America*, THE NATION, June 24, 1991, quoting WHITE, THE ROOTS OF DEPENDENCE (1990).

⁸⁴ Arno & Davies, *Fire History at the Forest Grassland Ecotone in Southern Montana*, 36(3) JOURNAL OF RANGE MANAGEMENT 332-36 (1990).

⁸⁵ YOSEMITE FIRE MANAGEMENT PLAN, *supra* note 72, at 14-15.

⁸⁶ Stephen W. Edwards, *Observations on Prehistory and Ecology of Grazing in California*, 20(1) FREMONTIA 5 (1992).

⁸⁷ Tom Kenworthy, *Unraveling of Ecosystem Loans in Oregon Forest*, WASH. POST, May 15, 1992 at B3, quoting JOURNAL OF REBECCA KETCHA (1853).

range improvement as early as 1945, long before prescribed fire was recognized as a legitimate management practice.⁸⁸

C. Urbanization Brought with It a Fear of Fire Which Resulted in a Policy of Fire Suppression on Public Lands Until 1968

The industrial world of urban America feared and suppressed fires. As America settled and developed its vast rangeland and forest frontiers, a controversy emerged between two types of fire practice: that of the Native American's as continued by the frontier agrarian sector and that of industrial society, which saw only the destructiveness of fire.⁸⁹ Today, the Act's bias against prescribed fires is a direct legacy of industrial America's urban-based fear of fire.

As the towns and industries flourished, the philosophy of fire suppression became the dominant political force in the early development of federal forest management.⁹⁰ Moreover, by the beginning of the 20th Century, Americans had already witnessed the destructive power of fire in urban settings.⁹¹

Thus, the United States Forest Service was initially conceived as a fire suppression organization.⁹² As a forester stated at a 1941 forestry conference: "We have been so industrious in our crusade against fire that the public generally recognizes us as a fire organization rather than a forest organization."⁹³ The policy of fire suppression gained wide public support with the creation of Smokey Bear in 1945.⁹⁴ The appeal of Smokey Bear was legendary as the spokesman for fire prevention and suppression.

During the same time, the story of Bambi popularized the notion

⁸⁸ PYNE, *supra* note 5, at 100.

⁸⁹ The "light burning" controversy in California in the middle to late 1800's is an example of the historic shift away from the frontier's style of burning forest and rangeland to encourage pasturage, reduce brush, and lessen fuel accumulations in the forest. The discussions attracted powerful advocates on both sides of the issue. For example, in 1889, the renowned explorer and geologist, John Wesley Powell, extolled the virtues of prescribed or "light" fire. Nevertheless, by 1924, the practice of light burning became "official heresy" among land management professionals. For a detailed account of the controversy see PYNE, *supra* note 5, at 100-12.

⁹⁰ PYNE, *supra* note 5, at 195.

⁹¹ *Id.* at 194.

⁹² *Id.* at 196.

⁹³ Conarro, *Fire Effects and Use*, U.S. FOREST SERVICE, PRIEST RIVER FIRE MEETING PROCEEDINGS, 57 (1941).

⁹⁴ PYNE, *supra* note 5, at 177.

that fire was an enemy of the forest and its creatures.⁹⁵ Gradually, through both internal industrial policy and public perception, the terms forestry and fire control became synonymous in the eyes of Americans. Not until 1968⁹⁶ did both the National Park Service and the United States Forest Service change their policies and recognize fire as a useful tool in successful land management.⁹⁷

D. Since 1968, Land Managers Have Used Prescribed Burning to Promote Healthy Forests and Rangelands

Current land management recognizes the necessity of prescribed burning to promote healthy forests and rangelands. The Secretaries of the Interior and Agriculture recently appointed a Fire Management Policy Review Team to review federal prescribed burning programs.⁹⁸ The final report, issued in 1991, reaffirmed that fire prevents the over-accumulation of fuels that leads to uncontrollable wildfires.⁹⁹

Land managers use prescribed fire on many types of land, including forest, agricultural fields, and rangelands. Simply stated, prescribed burning is "simulating the low intensity natural fires that have burned the landscape for centuries."¹⁰⁰

In writing a prescription for fire, the land manager must account for the type and size of available fuel, weather conditions, fuel moisture,

⁹⁵ *Id.* at 196.

⁹⁶ Jan van Wagtenonk, *The Evolution of NPS Fire Policy*, FIRE AND THE ENVIRONMENT: ECOLOGICAL AND CULTURAL PERSPECTIVES CONFERENCE 330, (March 1990).

⁹⁷ *Id.*; From the 1950's to the early 1970's, the National Park Service experimented with prescribed fire programs. The formal adoption of prescribed fire policies included objectives of improving wildlife habitat, reducing the hazardous buildup of fuels, and establishment of fuel breaks. RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION, GENERAL ACCOUNTING OFFICE, PRESCRIBED FIRE PROGRAM 2-3 (GAO/RCED 81-42).

⁹⁸ FEDERAL FIRE MANAGEMENT PLAN, *supra* note 42, at 1.

⁹⁹ *Id.*; The Yellowstone fire burned over 700,000 acres with fire fighting costs of over \$100 million. The program calls for "prescribed natural fires" (lighting ignited fires) or "management ignited prescribed fire" (fires started by fire specialists) to be allowed to "let burn" if: 1) its purpose was to meet management objectives; 2) it did not threaten human life or property; 3) it remained within prescribed boundaries; and 4) resources were available to control it. *Id.*

¹⁰⁰ Biswell, *supra* note 6, at 151. Professor Biswell further notes: "Prescribed fire as a management tool is an interesting and challenging subject for three reasons: first, it is working in harmony with, and not against, nature. Second, fire is a powerful tool — used wisely it can be very rewarding, but in untrained hands, it can be devastating. Third, fire is related to almost every aspect of the environment — the soils and water, the atmosphere, plants and animals, diseases and insects, people and politics." *Id.*

and location of human structures.¹⁰¹ By eliminating or reducing naturally accumulated fuels, the prescribed fire decreases the chance occurrence of a wildfire.¹⁰² The resulting use of prescribed fire to create "breaks" and "mosaics" in fuel continuity also allows for better control of wildfires.¹⁰³ A prescribed fire program such as this is credited with mitigating the "A" rock fire of 1990 in Yosemite, which was quickly controlled in an area where fuel elimination had previously occurred.¹⁰⁴

According to Professor Jim Agee of the University of Washington, "We've got to bring Smokey back with a different message."¹⁰⁵ Forest ecologists understand the need to give the public a message other than one which connects fire with destruction of forest lands and its furry creatures. Stephen Pyne also emphasizes the necessity of prescribed and natural fires: "If we don't create [fires] in our time frame on our scale, Mother Nature will provide them for us, and it may be on a scale and time frame we don't like."¹⁰⁶ Thus, land managers recognize that wildfires will burn regardless of human efforts, and that the resulting fire will be hotter, more intense, more destructive, and produce more smoke, than a naturally occurring fire. In the words of the fire ecologist: "burn now or burn later."¹⁰⁷

The land manager's principle of encouraging the use of prescribed and natural fire took on a broader meaning in the aftermath of the recent Yellowstone and Yosemite fires.¹⁰⁸ As those fires burned, a debate ensued about the value of prescribed fires, especially in light of the ultimate uncontrollability of the Yellowstone fire, and the rapid containment of the fire in Yosemite.¹⁰⁹

California Department of Forestry and Fire Protection spokesperson Karren Terrill stated that, "Sixty-one percent of California is covered

¹⁰¹ Edwards, *supra* note 86, at 13-19.

¹⁰² *Id.* at 3.

¹⁰³ PYNE, *supra* note 5, at 41.

¹⁰⁴ Interview with Steven Underwood, Fire Management Officer, Yosemite National Park (July 14, 1992); see also FEDERAL FIRE MANAGEMENT PLAN, *supra* note 42, at 4.

¹⁰⁵ Dietrich, *supra* note 3, at B7.

¹⁰⁶ PYNE, *supra* note 5, at 4.

¹⁰⁷ Jan van Wagtenonk, *Fire Suppression Effects on Fuels and Succession in Short-Fire-Interval Wilderness Ecosystems*, WILDERNESS FIRE SYMPOSIUM, 124 (Nov. 15-18, 1983).

¹⁰⁸ FEDERAL FIRE MANAGEMENT PLAN, *supra* note 42: The 1990 "A" Rock fire in Yosemite National Park was extinguished in one week; the aggressive prescribed and natural fire program in the park is attributed to preventing another disaster on the scale of Yellowstone.

¹⁰⁹ *Id.*

with wildland. Fire is just part of California's ecological makeup. California was built to burn."¹¹⁰ Given the increasing cost of fire suppression amid ever-decreasing public funds for forest management, the use of prescribed and natural fires also offers the direct benefit of efficient use of wilderness resources.¹¹¹

The total acreage of forest lands burned by prescribed fire in 1988 exceeded five million acres.¹¹² The Forest Service estimates that in 1988 over eight million acres of combined forest, range and agricultural land were burned in the southern states.¹¹³ Prescribed burns in the Pacific northwest, California and Arizona comprise another six million acres, bringing the total of prescribed burn areas to a landmass the size of Maryland.¹¹⁴

Thus, modern land management has come full circle to recognize the necessity of fire for the healthy growth and production of range and timber lands. Nevertheless, the public perception identifying forest management with fire suppression continues to be reflected in environmental laws. As the review of the provisions of the Clean Air Act affecting fire has shown, legislators need to be educated about the benefits of a prescribed fire program.

¹¹⁰ Lou Cannon, *More Fires Foreseen in California: Officials Say State Was 'Built to Burn'*, WASH. POST, Oct. 10, 1991, at A4 (quoting Karren Terrill, California Department of Forestry spokesperson).

¹¹¹ Interview with Russell Roberts, Air Pollution Control Officer, Northern Sierra Air Quality Management District (Nov. 13, 1992) and Jan van Wagendonk, Research Scientist, Yosemite National Park (July 30, 1992). For example, the Cleveland fire (Aug. 1992) in the Lake Tahoe California region burned approximately 18,000 acres at a suppression cost of \$12,000,000. An aggressive prescribed fire program would have cost approximately \$90,000.

¹¹² PRESCRIBED BURNING DOCUMENT, *supra* note 38, at 2-8.

¹¹³ Edwards, *supra* note 86, at 2.

¹¹⁴ PRESCRIBED BURNING DOCUMENT, *supra* note 38, at 2-11.

III. THE BENEFICIAL USE OF FIRE IS ACHIEVED BY BALANCING ENVIRONMENTAL FACTORS WITH ECONOMIC CONSIDERATIONS
RESOLVING EXPRESS CONFLICTS IN THE LAWS

A. Congress' Preference that Managers of Timber and Rangeland Utilize Prescribed and Natural Fires Conflicts with the Clean Air Act's Air Quality Standards

Congressional legislation designed to protect endangered species,¹¹⁵ preserve land "unimpaired,"¹¹⁶ improve the forest for multiple uses,¹¹⁷ and to preserve the "wilderness character,"¹¹⁸ strongly recommends the use of prescribed and natural fire. But the current scope of PM-10 regulations makes the accomplishment of these land management objectives virtually impossible.

For example, the California spotted owl, a candidate for endangered species designation, requires an open forest best maintained by controlled fire regimes.¹¹⁹ In southern California, an interdisciplinary task force attempting to protect the necessary habitat of the owl has encountered serious conflicts between its goals and the PM-10 nonattainment restrictions in effect in the Los Angeles air basin.¹²⁰

Nowhere is the conflict between the Act and prudent land management more pronounced than in the Class I visibility standards of the Act.¹²¹ There, the land manager is confronted with the public's expectation of viewing a natural landscape without natural fires and the Act's implication that vistas are predominant over fire's role in the ecosystem process.

The Act does give land managers an opportunity to provide input regarding new projects and their effect on visibility.¹²² Paradoxically,

¹¹⁵ Endangered Species Act of 1973; 16 U.S.C.S. § 1531 (Law. Co-op. 1984 & Supp. 1992).

¹¹⁶ 16 U.S.C.S. § 1 (Law. Co-op. 1991 & Supp. 1992).

¹¹⁷ The Organic Act mandates the United States Forest Service "to improve and protect the forest within the boundaries"; 16 U.S.C.S. § 475 (Law. Co-op. 1978 & Supp. 1992).

¹¹⁸ Wilderness Act of 1964; 16 U.S.C.S. § 475; 78 Stat. 890 (Law. Co-op. 1984 & Supp. 1992). "It is ironical that The Clean Air Act classifies wilderness as Class I visibility areas, while the Wilderness Act requires that they be managed in their natural condition." Letter from Jan W. van Wagtenonk, Research Scientist, Yosemite National Park, to author (Nov. 11, 1992) (on file with author).

¹¹⁹ Telephone interview with Stephanie Hanley, Ph.D., Wildlife Biologist on Inter-agency Spotted Owl Task Force, Angeles National Forest (July 18, 1992).

¹²⁰ *Id.*

¹²¹ 42 U.S.C.S. § 7491 (Law. Co-op. 1989 & Supp. 1992).

¹²² 42 U.S.C.S. § 7492 (Law. Co-op. 1989 & Supp. 1992): "Before holding the

Class I requirements also place the National Park and Forest Services in the role of violators regarding their own fire programs, whose proper accomplishment may exceed PM-10 standards for that area. The conflict is even greater for the air pollution control officer who is pressured by land managers to allow a prescribed fire to burn with its attendant emissions, while the same day he is required to levy a fine against the local gravel plant for exceeding PM-10 standards.¹²³

Thus, federal and local officials who are supposed to be operating within a comprehensive environmental policy are at odds over which law or aspect of a law, whether air quality, visibility, or forest and rangeland regeneration, to follow. As discussed previously, the powers granted to the EPA and the lack of public appreciation for the value of controlled burning, resulted in an emphasis on air quality considerations. Thus, these considerations become the dominant force within the United States' environmental policy and curtail the proper use of prescribed and natural fire.

B. The Land Manager Balances the Use of Prescribed and Natural Fire with Conflicting Air Quality Mandates

Land managers have become accustomed to caring for forests and rangeland in a statutory and political climate adverse to the use of prescribed fire. In light of conflicting policy mandates, land managers balance the physical factors of terrain, climate, season, and the location of human structures, with economic considerations and overall environmental impact when writing a prescribed fire plan.¹²⁴

Today, as more homes are built in wildland areas, the need for litter reduction through prescribed fire has intensified.¹²⁵ The ecological need

public hearing on the proposed revision of an applicable implementation plan . . . the State (or the Administrator) . . . shall consult in person with the appropriate federal land manager or managers and shall include a summary of the conclusions and recommendations of the federal land managers in the notice to the public." For a good discussion of the visibility issue see Ostrov, *Visibility Protection under the Clean Air Act: Preserving Scenic Portland Areas in the Southwest*, 10 *ECOLOGY LAND QUARTERLY* 397 (1982).

¹²³ "Many of [new residents moving into California's rural area] have come from the South Coast and Bay Area at least partially to escape the severe air quality of those areas. These individuals have a low tolerance for smoke and are often shocked to find that they have moved to a rural community that has a severe winter time PM-10 problem and a summer ozone program as well." Robert, *supra* note 12.

¹²⁴ See generally Edwards, *supra* note 86.

¹²⁵ Peter W. Lahm & Donna V. Lahm, *The Future of Prescribed Fire in the West Considering PM-10 Standards and Other Air Quality Programs*, AIR AND WASTE

for controlled burning also increases because of the necessity of protecting these residential neighborhoods from wildfires. Ironically, these new residents, often former city-dwellers who have moved to rural areas for clean air, are not prepared to experience the smoke or haze caused by periodic burning.¹²⁶

Thus, the land manager seeks a consensus among developers, homeowners and the EPA to engage in a balancing of environmental factors to best serve both the land and its inhabitants. In rapidly developing rural areas, this balancing involves the use of prescribed fire to decrease the threat of devastating wildfires and to promote the continued growth of existing woodlands.

First, land managers seeking to promote the useful application of prescribed and natural burning are developing aggressive smoke management techniques.¹²⁷ Additionally, the managers develop an environmental assessment process for timber sales that addresses the concern for air quality, as well as comprehensive mitigation measures.¹²⁸

In order to promote the benefits of controlled fire versus the dangers of wildfires, managers are seeking comprehensive data on fire emissions, climate, and historic burn patterns. Planning fires during the tourist off-season can facilitate the use of prescribed fire.¹²⁹ Land managers have even suggested that areas of public land be closed 2-3 weeks of each year to allow for aggressive burn programs.¹³⁰ Unfortunately, prescribed fires should occur during the summer months in order to be ecologically correct,¹³¹ although such closures would avoid the potential threat to public health and negative perception created by burning on forest lands.

A better understanding of air dispersal patterns also mitigates the effects of prescribed and natural fires. This becomes particularly important when controlled burning is considered near residential developments. Fiscal considerations also favor a shift away from fire suppres-

MANAGEMENT ASSOCIATION AND EPA SPECIALTY CONFERENCE, 4 (Jan. 18, 1992).

¹²⁶ Russell Roberts, untitled paper presented at FOREST BIOMASS FORUM (July 1992) (on file with author).

¹²⁷ Roberts, *supra* note 111.

¹²⁸ For a good example of air quality requirements in timber sale mitigation see STANISLAUS NATIONAL FOREST, U.S. DEP'T OF AGRICULTURE, LITTLE MOSS FIRE SALVAGE ENVIRONMENTAL ASSESSMENT (March, 1991).

¹²⁹ Interview with Jon Christenson, Air Pollution Control Officer, Mariposa County, California (July 8, 1992).

¹³⁰ Interview with Michael Finley, Superintendent, Yosemite National Park (July 12, 1992).

¹³¹ van Wagtenonk, *supra* note 111.

sion toward prudent fire management. Ironically, the funding for suppression efforts is virtually unlimited while the use of prescribed fire must compete with other land management programs for dwindling funds.¹³² Since prevention of wildfires is far less costly than their suppression,¹³³ the land manager can promote prescribed burns as a cost-efficient tool in tough budgetary times.

C. The Education of Both Air Pollution Control Officials and the Public as to the Benefits of Controlled Burning Must Accompany the Balancing of Conflicting Environmental Objectives

Prior to any substantive change in the Clean Air Act, air pollution officials must address air quality standards in light of positive burn programs.¹³⁴ Thus, better meteorological and emissions data is essential to measure compliance with attainment standards and planning for optimal timing of burns.¹³⁵ Scientific models and application standards must be developed to assess when a prescribed fire is meeting air quality standards, and when it is not.

Also, air districts should examine potential trade-offs between prescribed fires and other emission sources.¹³⁶ For instance, a land management agency could convert its automobile fleet to alternative fuels in exchange for greater flexibility in its allotted number of burn days.

¹³² Interview with Ed Duncan, Prescribed Fire Manager, Yosemite National Park (July 15, 1992). Additionally, "Fire Management in Yosemite 1970-1991," a report to the Superintendent of Yosemite National Park, stated that the average cost per act for full suppression of human-caused fire was \$216, of lightning-caused was \$358; whereas the cost of natural fire management, including all associated limited suppression costs, was \$23 and that of prescribed burning \$19.

¹³³ The Yosemite fire of August, 1990 caused not only considerable direct suppression costs, but also indirectly cost the National Park Service: "The decision to evacuate was costly: at least \$50,000 a day in lost Park Service revenue, and several hundred thousand dollars a day for concessionaire Yosemite Park and Curry Co., which runs the hotels, restaurants and shops." Mariposa County also sustained direct budgetary costs of over \$150,000 in uncollected transient occupancy taxes. Interview with John McCamman, County Administrative Officer, Mariposa County (July 21, 1992).

¹³⁴ Interview with Molly Ross, Assistant Chief, Air Quality Division, National Park Service, Washington, D.C. (June 3, 1992). The National Park Service is currently negotiating with Air Pollution Control Districts of Mariposa and Tuolumne Counties to develop a memorandum of understanding which sets forth the criteria and conditions for the management of smoke from prescribed fires.

¹³⁵ Janice Peterson, *Development of PM-10 Emissions Inventory from Prescribed Fire in the United States during 1989*, 84TH ANNUAL MEETING AND EXHIBITION OF AIR AND WASTE MANAGEMENT ASSOCIATION, 8 (June 16-21, 1991).

¹³⁶ Telephone interview with John Harris, Air Quality Division, Environmental Protection Agency, Triangle Park, North Carolina (July 12, 1992).

Transit systems could be used within park boundaries in much the same manner.¹³⁷

Another avenue of accommodating land managers would be to change the definition of seasonal versus year around sources. Most prescribed burning is not a year around emission source, but takes place within defined time-frames.¹³⁸ An exemption for periodic anthropogenically-created sources might relieve air pollution officials of the need to extensively redraft PM-10 guidelines.

Provided that land managers and air pollution officials can effectively educate each other in developing a prescribed fire philosophy, the public must be informed. There has been a definite shift in the public's acceptance and understanding of fire. A recent survey found that "there is a need for greater information about the size of natural fires, wildlife mortality, ecological effects of fire suppression, and the capability of natural fire to [reduce litter]."¹³⁹

This education effort must focus on rural residents, tourists traveling into affected areas, and on larger urban populations. It is particularly important to explain the economic rationale for prescribed fires: they promote healthy forests and ultimately more affordable wood products.¹⁴⁰ Those utilizing the woodlands for recreation purposes must understand that controlled fire can successfully preserve the ecosystems vital to their enjoyment.¹⁴¹

At the same time, land managers and air quality officials must explain what measures are being taken to reduce emissions and manage smoke from prescribed fires. The educational process must extend to the professional level. While the issue of air quality and public awareness has become a topic in air quality, fire management, and biomass conferences, a symposium dedicated specifically to prescribed fires and air quality would provide vital education for the public. This outreach should include general managers such as Forest Supervisors, Park Superintendents, Regional Foresters and air board members.

¹³⁷ For instance, the YOSEMITE AREA REGIONAL TRANSIT ACTION PLAN was developed by Yosemite National Park and the adjacent counties and has, among its goals, the reduction of "air quality impacts in the Yosemite region." MARIPOSA COUNTY LOCAL TRANSPORTATION COMMISSION, YOSEMITE AREA REGIONAL TRANSIT PLAN.

¹³⁸ 42 U.S.C.S. § 7418 (Law. Co-op. 1984 & Supp. 1992).

¹³⁹ McCool and Stankey, *Visitor Attitudes Toward Wilderness Fire Management Policy (1971-1984)*, 357 RESEARCH PAPER INT. 7 (Jan. 1986).

¹⁴⁰ Telephone interview with Jerry McGowen, Fire Officer, Groveland Ranger District, Stanislaus National Forest (July 14, 1992).

¹⁴¹ Peterson, *supra* note 135, at 2.

IV. NOTWITHSTANDING THE GREATER COORDINATION AMONG LAND MANAGERS AND AIR POLLUTION OFFICIALS, CONGRESS NEEDS TO REVISIT THE CLEAN AIR ACT AND ITS IMPLEMENTING REGULATIONS TO RECOGNIZE THE BENEFITS OF PRESCRIBED AND NATURAL FIRES TO THE OVERALL ECOSYSTEM HEALTH

A. *Congress Should Amend the Clean Air Act to Exempt Smoke Generated from Prescribed and Non-suppressed Natural Fires*

The Clean Air Act should be amended¹⁴² to exempt smoke generated by controlled fires from PM-10 compliance. As this Comment has illustrated, such fires are necessary for the overall health of forest and range ecosystems. The environment does not respond in a unified fashion, but instead encourages the advancement of often competing, but compatible, restorative efforts for its improvement. The public's desire for clean air, clear vistas, natural parks, protected species, and productive and affordable timber, must be achieved by Congress through a balancing of mandates and their varied applications.

Moreover, only Congress can undo the direct conflicts which its laws have created. For instance, the Wilderness Act prohibits the use of motorized equipment in certain wildlife refuges,¹⁴³ making prescribed fire the only management tool available for litter reduction. But provisions of the Clean Air Act restrict the use of prescribed fire to achieve mandated land management goals.¹⁴⁴

These amendments would probably involve redrafting the distinction between anthropogenic and non-anthropogenic sources as they relate to prescribed and natural fire regimes. Additionally, by focusing on the effect that specific sources have on the entire ecosystem, the potential ecological benefits of fire might be freed from mischaracterization pursuant to the Act and better utilized by land managers.

Next, the Clean Air Act should be amended purposefully to differentiate between agricultural burning, natural fire, and prescribed fire. These distinctions will allow land managers prudently to apply the proper fire regimes in relation to surrounding attainment and nonattainment areas, and to give local agencies more guidance in crafting a

¹⁴² The recommendations which follow concerning amendments to the Clean Air Act were developed in conversation with many of the specialists and scientists consulted for this Comment.

¹⁴³ Jan van Wagtenonk, *The Role of Fire in the Yosemite Wilderness*, NATIONAL WILDERNESS RESEARCH CONFERENCE, 2-8, (July 23-26, 1985).

¹⁴⁴ Roberts, *supra* note 126.

controlled fire program for their specific region.¹⁴⁵

Congress should provide funds to federal land agencies properly to monitor and manage prescribed fire. Funding aggressive prescribed fire programs to minimize air degradation and maximize the area burned has proven less costly than indiscriminately suppressing beneficial and hazardous fires alike.¹⁴⁶

Emission trading or a credit-debit system might also be designed to permit prescribed fires while compensating for their pollution elsewhere.¹⁴⁷ For example, a new industrial plant in California's central valley could offset its emissions by funding programs that would reduce background emissions of PM-10 from management fires on federal lands. This approach would facilitate more aggressive management on federal lands without additional cost to the taxpayer.

B. The Administrative Agencies Responsible for the Implementation of the Clean Air Act Must Acknowledge the Inter-relationship of Fire to Overall Ecosystem Health

The EPA must take into account the interrelationship of fire with all ecosystem components in addition to air. The current regulatory process does not address environmental problems in a comprehensive manner. In the recent promulgation of guidelines for silvicultural burning pursuant to Section 190 of the 1990 Amendments,¹⁴⁸ the EPA did involve land managers and fire professionals, but ultimately failed to recognize the necessity of fire as a productive and necessary component equal (or greater) in importance to alternatives to burning. The EPA should actively seek the direct involvement of federal agricultural and timber industry members in the current writing of the visibility report and regulations under Section 196B.¹⁴⁹

The California EPA is currently designing a "comparative risk approach"¹⁵⁰ to its regulatory process that recognizes the narrow focus of

¹⁴⁵ *Id.*

¹⁴⁶ Interview with Jan van Wagtenonk, Research Scientist, Yosemite National Park (Nov. 14, 1992).

¹⁴⁷ The concept of emission trading is used in non-attainment areas to allow a new pollution source to be permitted by taking the place of an existing source either by trade or sale. For the most current discussion of emission trading see SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, REGIONAL CLEAN AIR INCENTIVE MARKET: SUMMARY RECOMMENDATIONS (Spring, 1992).

¹⁴⁸ 42 U.S.C.S. § 7513 (Law. Co-op. 1989 & Supp. 1990).

¹⁴⁹ *Id.* § 7492.

¹⁵⁰ Interview with Michael Mantel, Undersecretary of Resources, State of California (July 17, 1992).

existing regulations and attempts to broaden their application. This prioritization of goals through a balanced regulatory process could be utilized by the federal EPA in its recognition of the beneficial uses of prescribed fire programs.

C. The President Could Exempt Prescribed Fires from EPA Regulation

The President of the United States has the authority to exempt emission sources if it is determined to be in the "paramount interest of the United States to do so."¹⁵¹ While recent administrations were unlikely to make such a finding, President Clinton and Vice-President Gore have exhibited a more balanced, if not enlightened, view of land management practices than previous administrations:

It is now all too easy to regard the earth as a collection of "resources" having an intrinsic value no larger than their usefulness at the moment. Thanks in part to the scientific revolution, we organize our knowledge of the natural world into smaller and smaller segments and assume that the connections between these separate compartments aren't really important. In our fascination with the parts of nature, we forget to see the whole. The ecological perspective begins with a view of the whole, an understanding of how the various parts of nature interact in patterns that tend toward balance and persist over time.¹⁵²

Additionally, under the pressure to achieve certain cost-cutting goals, the incoming administration is encouraged to reexamine the comparative costs associated with fire suppression versus prescribed burning.

V. CONCLUSION

The increasing urbanization of rural America has brought with it demands for clean air, fire-safe and productive forests, and natural parks. Local, state, and federal agencies responsible for clean air and conservation of our natural resources must work together to educate the public on the role of prescribed fire in land management.

They must also cooperate with each other in promulgating regulations which account for the health of the entire ecosystem, including the health of humankind, local and regional economies, and the forests and rangeland.

Congress must amend the Clean Air Act to recognize the necessary role of prescribed and natural fires. Ultimately, the greatest lesson to be derived from this complex issue and this Comment's treatment of it, is

¹⁵¹ 42 U.S.C.S. § 7418(b) (Law. Co-op. 1989 & Supp. 1990).

¹⁵² AL GORE, *EARTH IN BALANCE* 52 (1992).

that federal mandates must not be drafted and implemented in isolation from the effect they have on other essential mandates which also contribute to a healthy ecosystem. Single purpose laws yield single purpose results. By accounting for prescribed fires, the Clean Air Act will serve the broader goal of promoting the health of all sectors of our fragile ecosystem.

ARTHUR GUY BAGGETT, JR.