

General
JUNE 1997

LIBRARY COPY

WILDLAND FIRE MANAGEMENT PLAN

BANDELIER NATIONAL MONUMENT

NEW MEXICO



13051

WILDLAND FIRE MANAGEMENT PLAN
BANDELIER NATIONAL MONUMENT

NEW MEXICO

January 1997

Prepared by: John D. Lissaway Date: 2-28-97
Fire Management Officer

Reviewed by: Chausse Lydonis Date: 6/29/97
Chief, Resources Management

Reviewed by: _____ Date: _____
NPS Fire Director, NIFC

Recommended by: J. W. W. Date: 6/30/97
Superintendent, Bandelier NM

Approved by: John A. King Date: 6/30/97
ACF Field Director, Intermountain Area

ADDENDUM TO THE JANUARY, 1997 FIRE MANAGEMENT PLAN BANDELIER NATIONAL MONUMENT

The US Fish and Wildlife Service (USFWS) sent Bandelier National Monument (park) a letter on December 4, 1995 in response to a request for concurrence with the park's determination (through a Biological Assessment) that the proposed Bandelier Fire Management Program "may affect, but is not likely to adversely affect" proposed, threatened, or endangered species. The species covered in this correspondence were the "threatened Mexican spotted owl (Strix occidentalis lucida) (owl) and bald eagle (Haliaeetus leucocephalus), and the endangered southwestern willow flycatcher (Empidonas trailii extimus) and peregrine falcon (Falco peregrinus anatum). The USFWS concurred with the park's determination for three of these species, but not with the park's determination regarding the owl because the Bandelier FMP proposed activities was inconsistent with the Recovery Plan for the owl. Additional "communication regarding [USFWS] concerns" was requested for the owl.

The 1996 Dome Fire and receipt of substantive new elk impacts research fundings precluded our preparation of information to the USFWS to justify our proposed fire management actions on management ignited prescribed fires (MIPFs). An addendum to the 1995 BA will be prepared this fall (1997). However, in the interim the following actions will be taken (and constraints imposed) relative to the Bandelier Fire Management Plan:

- 1) The Prescribed Natural Fire component of the Bandelier FMP will be instituted as stated in the January 1997 FMP since the USFWS concurred with us that "lower intensity prescribed natural fire may have some short-term negative effects to owl habitat but much less than a catastrophic fire that would severely impact habitat conditions."
- 2) The MIPF component of the Bandelier FMP is hereby modified so that no MIPFs will be ignited in occupied nesting habitat until we have provide enough evidence (through an addendum BA) to satisfy the USFWS that our finding of "may affect, but is not likely to adversely affect" if we implement the FMP is correct.

TABLE OF CONTENTS

I.	Introduction and Policy Compliance	1
II.	Goal and Management Objectives	3
III.	Description of Monument	5
	A. Climate	5
	B. Topography, Geology and Soils	5
	C. Vegetation	7
	1. Cerro Grande Area	7
	2. Frijoles Canyon Area	10
	3. Burnt-Escobas Mesas, mesas south to the monument boundary	11
	4. Canyon bottoms of Lummis, Alamo, and Capulin; Portions of Medio, Sanchez, and Whiterock Canyons	11
	5. Tsankawi area	12
	D. Fauna	12
	E. Cultural Resources	12
	F. Air Quality	13
	G. Water Resources	13
	H. Human Uses	14
IV.	The Historic Role of Fire in Bandelier and the Jemez Mountains	15
	A. Fire History	15
	B. Fuels	21
V.	Fire Management Strategies	23
	A. Wildfire Suppression	23
	B. Prescribed Fire Management	23
	C. Fire Management Zones	23
	1. Suppression Zone	24
	2. Prescribed Natural Fire Zone	24
	D. Management Constraints	24
	1. Chemical Retardants	24
	2. Dozers	25
	3. Sensitive areas or species	25
	E. Fire Management Committee	25
VI.	Wildfire Program	27
	A. Fire prevention	27
	1. Objectives	28
	2. General action items	28

B.	Presuppression	29
1.	Training, qualifications, and certification	29
2.	National Fire Danger Rating System (NFDRS)	31
C.	Emergency Presuppression	32
1.	Staffing plan	32
2.	Funding	32
D.	Pre-attack plan	32
E.	Detection and dispatch	33
F.	Suppression	33
1.	Interagency contacts and coordination	34
2.	Transition	35
G.	Records and reports	35
H.	Rehabilitation	35
VII.	Management Ignited Prescribed Fire Program	37
A.	Program overview and Ten-year Schedule	37
1.	Management Ignited Prescribed Fire Units	37
2.	Ten-year Prescribed Fire Schedule and Unit Map (Appendix M)	38
3.	Hazard fuel reduction	38
4.	Resource Management Prescribed Fire	38
B.	Prescribed Fire training, certification, and organizational requirements	39
1.	Positions	39
2.	Training plan	39
C.	Annual burn program management	39
1.	Burn plan elements	40
2.	Prescriptions	40
D.	Prescribed Fire monitoring	41
E.	Documentation requirements	41
1.	Fire Report, DI-1202.	41
2.	Postburn narrative	41
3.	Data	42
4.	Maps	42
5.	Filing	42
F.	Fire evaluation	42
VIII.	Prescribed Natural Fire Program	43
A.	Management guidelines for Prescribed Natural Fires (PNF)	43
B.	Decision Chart for Prescribed Natural Fires	46
C.	Monitoring and reporting	47
D.	Funding and cost accounting	48
E.	Public information actions for Prescribed Natural Fire	48
IX.	Air Quality/Smoke Management Guidelines	49
A.	Smoke from combustion	49

B.	Compliance and public Information	50
C.	Smoke management strategies	51
X.	Fire research and monitoring	53
XI.	Public and employee safety	53
XII.	Public information and education	55
XIII.	Cultural Resources	57
A.	Effects of fire management activities on cultural resources	57
B.	Management and protection strategies for cultural resources	58
1.	Planning and preparation	58
2.	Mitigating impacts on On-going Fires	59
3.	Mitigation of impacts on Prescribed Fires	59
XIV.	Fire Critiques	61
A.	Hotline review for Wildfire incidents	61
B.	Incident Management Team closeout	61
C.	National Review	61
D.	Program Reviews	61
E.	Prescribed Fire Critiques	62
XV.	Consultation and Plan Review	63
A.	Consultation	63
B.	Review	63

List of Figures

Figure 1. Vicinity Map, Bandelier National Monument.	6
Figure 2. Changes in Montane Grassland Area, 1935-1981, Jemez Mountains, New Mexico.	9
Figure 3. Relative scar position by century for all fires, 1600-1899.	17
Figure 4. Frijoles watershed fire history.	18
Figure 5. Mixed conifer size-class distribution.	19
Figure 6. Ponderosa pine forest size-class distribution, Monument Canyon Research Natural Area.	20

I. Introduction and Policy Compliance

The Fire Management Plan is an implementation document that serves as an addendum to the park Resources Management Plan and meets requirements under the National Environmental Policy Act (NEPA) through an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI).

This document is also guided by NPS Fire Management Guideline (NPS-18, 1990), which requires that any area with vegetation capable of supporting fire will develop a Fire Management Plan. The Organic Act of the National Park Service (August 25, 1916, Section 102) provides the authority for implementation of this plan. Further, the Wilderness Act of 1964 (PL 88-577) and the National Parks and Recreation Act of 1978 were considered in the planning process.

Funding authorities for the fire management program are found in Section 102 of the general provisions of the Department of Interior's annual appropriations bill.

Presidential Proclamation No. 1322 of February 11, 1916 (39 Stat. 1764), which established Bandelier National Monument, stated that "...certain prehistoric aboriginal ruins...are of such unusual ethnological, scientific and educational interest...that the public interest would be promoted by preserving these relics of a vanished people, with as much land as may be necessary for the proper protection thereof...".

The significance of Bandelier lies in its superb combination of cultural, natural and wilderness values. In official recognition of these values, President Ford signed legislation in October 1976, creating a 23,267 ac (9,423 ha) Bandelier Wilderness.

According to recent studies, major park vegetative communities in the southwest evolved with fires of natural origin (Weaver 1951, Caprio et al 1989, Allen 1989, Swetnam 1990, Swetnam and Lynch 1993). Consequently, a forest structure consisting of small, even-aged groups within a larger, uneven-aged mosaic was maintained by fire within the ponderosa pine and mixed conifer cover type. Piñon-juniper woodlands within the monument were historically open with relatively dense grasses, herbs, and organic litter; hence, soils were protected. Higher elevation montane grasslands and open meadow areas were also created and maintained predominately from periodic surface fires.

II. Goal and Management Objectives

This Fire Management Plan prescribes actions necessary to implement Servicewide fire management policies (NPS-18 1990) and to achieve park resource management objectives. The park's primary resource management goal is:

... to preserve, protect, and manage the park's cultural and natural resources within naturally functioning ecosystems, consistent with cultural resource preservation (NPS 1995)

Bandelier National Monument's fire management objectives support this goal, and they are: (1) to allow prescribed natural fires to function in fire-dependent ecosystems; (2) to use fire to meet management objectives; (3) to protect life, property, and park resources from the effects of unwanted fire; and (4) to prevent adverse impacts from fire suppression.

The following fire management strategies should maximize opportunities to achieve these four objectives.

Objective 1: Allow prescribed natural fires to function in fire-dependent ecosystems:

- Permit prescribed natural (lightning-caused) fires in areas where fire dependency has been scientifically proven and the fuel load and vegetative composition are within the range of natural variability
- Permit prescribed natural fires within constraints of policy (NPS-18) and the Environmental Assessment, Fire Management Plan

Objective 2: Use prescribed fire to meet management objectives:

- Create and/or maintain defensible prescribed natural fire boundaries
- Where applicable, restore fuel loads and plant community structure and composition to ranges of natural variability comparable to pre-Anglo settlement using a predetermined regimen of management-ignited prescribed fires
- Minimize the occurrence of unnaturally intense fires through reduction of hazard fuels by management-ignited prescribed fires
- Avoid prescribed fires which would reduce air quality in densely populated areas for extended periods (beyond two weeks)
- Train park staff and cooperators to conduct safe, objective-oriented prescribed fires consistent with NPS-18 requirements

- Provide opportunities for public understanding of fire ecology principles, smoke management, and prescribed fire program objectives
- Monitor and evaluate the effectiveness of the prescribed fire management program

Objective 3: Protect life, property, and park resources from the effects of unwanted fire:

- Conduct all fire management activities commensurate with applicable laws, policies, and regulations.
- Suppress all unwanted fires (declared wildfires) in the park and in the interagency mutual aid zone
- Cooperate extensively with adjacent land management owners through Memoranda of Understanding to facilitate safe and prompt suppression of wildfires
- Suppress all wildfires with minimum cost, environmental and cultural resource impacts
- Use prescribed fire and/or mechanically treat the park's developed zones to simulate the effects of lightning-caused fires and to reduce the threat of unwanted fire
- Prevent unplanned human-caused ignitions through a cooperative fire prevention program
- Provide for the safety of park visitors, neighbors, and employees during all phases of wildland fire management operations
- Provide opportunities for public understanding of the wildland urban intermix problem

Objective 4: Prevent adverse impacts from fire suppression:

- Use minimum impact fire suppression techniques and rehabilitate disturbed areas to protect natural, cultural, wilderness, and scenic resources from adverse impacts attributable to fire suppression activities
- Suppress unwanted fires commensurate with values at risk
- Ensure that a resource advisor is present on all major suppression actions
- Engender understanding among firefighters about the impacts of fire suppression on sensitive park resources
- Avoid the use of non-native seed to rehabilitate sites disturbed by wildfires or their suppression

III. Description of Monument

The monument's Resources Management Plan (1995) and Statement for Management (1988) contain broad physical descriptions of the monument's environment.

Bandelier National Monument is located in north-central New Mexico on the east slopes of the Jemez Mountains (see Figure 1) in an area called the Pajarito plateau. Bandelier is bounded by the Baca Land and Cattle Company to the northwest, (13% of the total boundary), the Cañada de Cochiti Grant to the south (10%), the Santa Fe National Forest to the west and east (46%) and the Department of Energy to the north (31%).

A. Climate

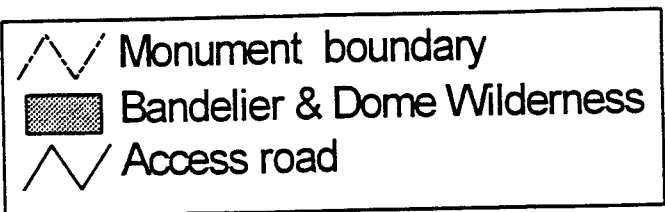
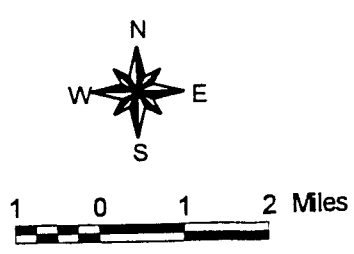
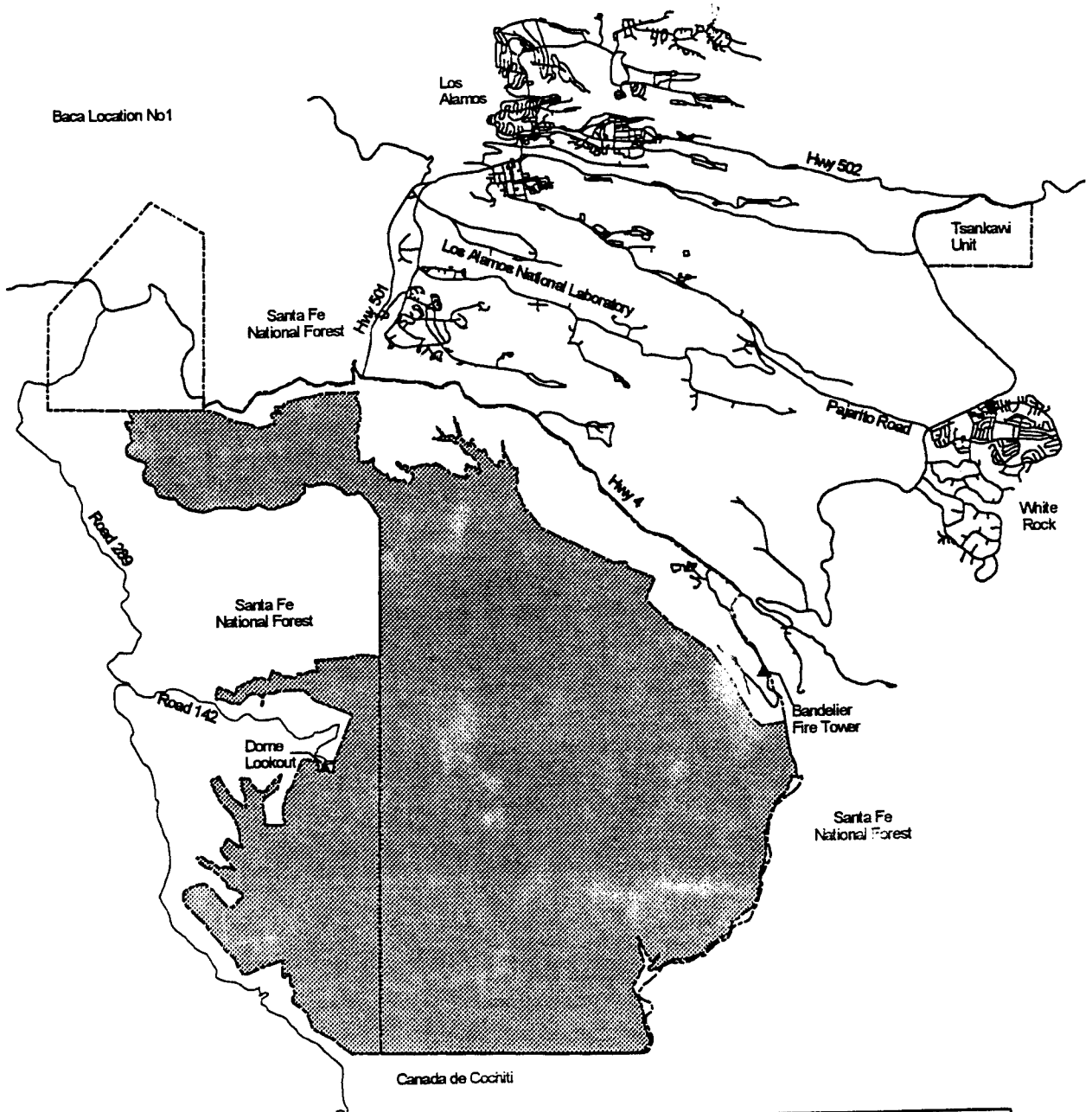
Bandelier lies in an area defined as semi-arid continental climate, but with a great deal of variability which is largely elevation-dependent. According to Allen (1989), annual precipitation within the monument, ranges from approximately 12 in (30 cm) at lowest elevations along the Rio Grande to near 35 in (90 cm) on the top of Cerro Grande. Mean annual precipitation at the monument fire tower, elevation 6,600 ft (2012 m) is 16 in (40.7 cm). Periods of dryness can range from late April through the end of June, ending with an average two-month "monsoon" through August. Sixty percent of the annual precipitation falls between June and September, with thunderstorms reported for fifty eight percent of the days in July and August.

Cyclonic storms in winter result in snow at all elevations. The growing season in Los Alamos averages five months (May 6-October 16)(Allen 1989). Wide fluctuations in precipitation during the year are common. The warmest month is July (mean temperature 82°F (28°C) and January the coldest, with a mean temperature of 28°F (-1.6°C).

B. Topography, Geology and Soils

Bandelier National Monument is situated on the Pajarito plateau, which comprises the east flank of the Jemez Mountains, a large caldera system which erupted over one million years ago. The gently sloping plateau is composed primarily of ash tuff, and is cut by three major canyons within the monument: Frijoles, Alamo, and Capulin. Portions of Medio and Sanchez canyons are located in the southern end of the monument. The eastern margin of this massive tuff formation is the Cerros del Rio basalt in which the Rio Grande flows through White Rock Canyon.

Figure 1.
 Bandelier National Monument and Vicinity



Common soil parent materials in the Jemez mountains range from rhyolites and andesites at higher elevations to tuff and pumice at low elevations and basalt at the Rio Grande River (Allen, 1989). Common soils include Entisols, Inceptisols, Alfisols, Mollisols, and Aridisols in and around the monument.

C. Vegetation

There are difficulties in defining monument vegetative patterns as related to fire susceptibility, fire behavior potential, modeling of fuels (see Chapter IV), and prediction of fire effects. Species composition changes both within and along elevational and moisture gradients and aspect; in other words, a relatively uniform compositional "mix" will not necessarily be maintained from stand to stand within a particular cover classification. The following is a broad description of the general vegetative complex as described by Allen (1989).

From the eastern boundary at the Rio Grande River 5300 ft (1616 m) and passing upward, juniper grasslands occur to approximately 6233 ft (1900 m); piñon-juniper woodland to 6890 ft (2100 m); ponderosa pine (*Pinus ponderosa*) forest 6890 to 7500 ft (2100-2300 m); mixed conifer forest consisting of ponderosa pine, Douglas fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), aspen (*Populus tremuloides*), and limber pine (*Pinus flexilis*) from 7500 to 9500 ft (2300-2900 m) and finally spruce-fir forest of Engelmann spruce (*Picea engelmannii*) and corkbark fir (*Abies lasiocarpa* var. *arizonica*) occurring on the north slopes above 9500 ft (2900 m) (Allen, 1989).

The following is a discussion of major landscape areas, cover types, fire history and potential fire behavior.

1. Cerro Grande Area

The Jemez montane grasslands, of which the extensive grassland on Cerro Grande is representative, is a unique ecosystem worthy of preservation. Recent investigation of this region shows that this native grass/forb community is being encroached upon rapidly, primarily by ponderosa pine and Douglas fir.

Among the primary factors contributing to the establishment and maintenance of these grasslands are (1) periodic fire; (2) animal grazing activity; (3) southerly exposure; (4) soil drought due to wind blown transfer of winter snows which creates xeric conditions favoring grasses over trees; (5) deep "A" horizon soils typical of grasslands; and (6) grassland competition against tree seedling establishment.

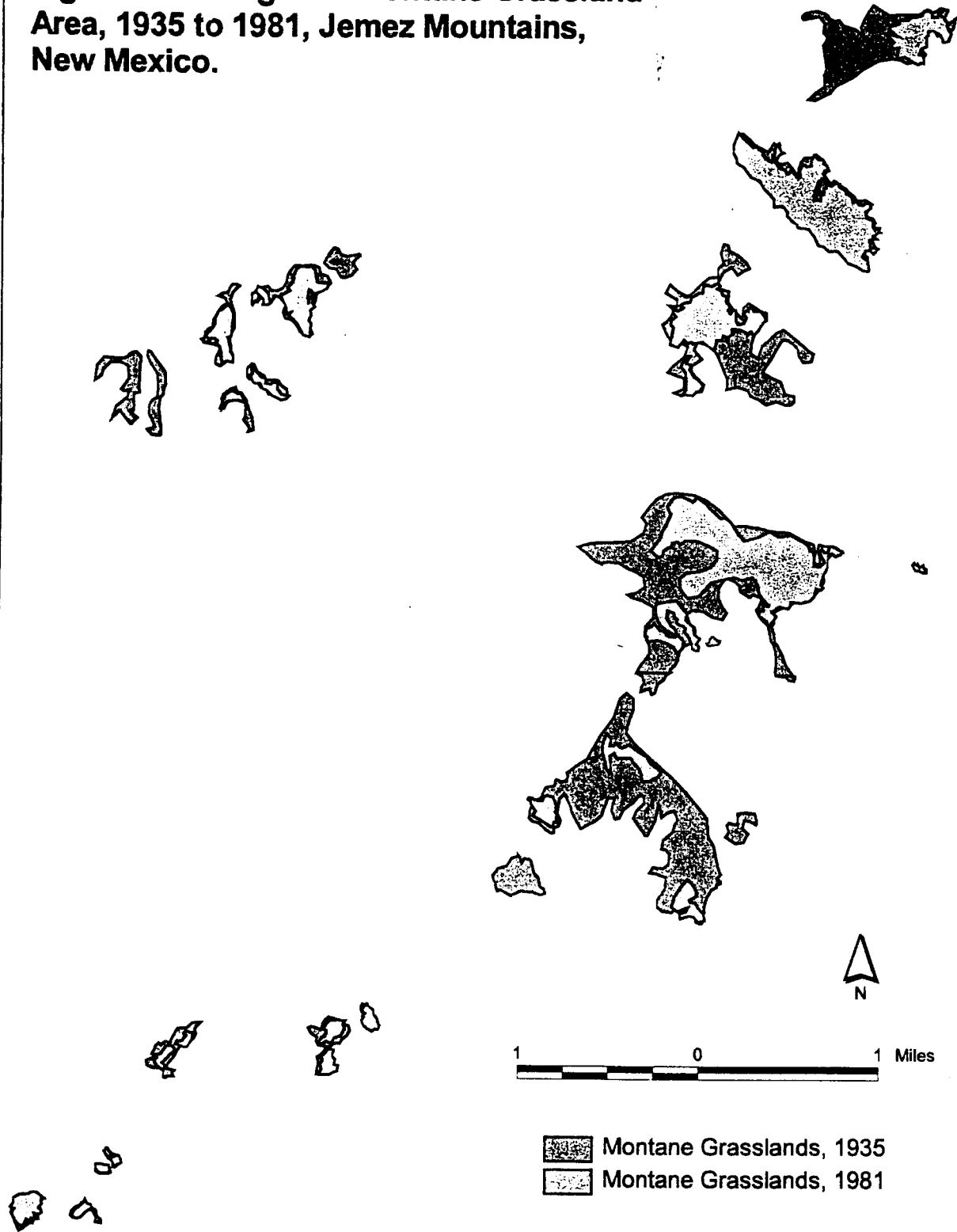
Several of these factors have been altered with time to the extent that presently we are observing a rapid site conversion around the Cerro Grande summit. Hundreds of increment cores from representative sized trees in this area support the premise that aggressive tree invasion began in the late 1910's and continued, with fluctuations, through the present time. It is generally acknowledged that fire is probably the most influential force acting against tree encroachment on grasslands. Tree invasion has also been affected by grazing of domestic livestock in the Cerro Grande area. The rather abrupt replacement of sheep by cattle prior to the 1920's coincides with the beginning of coniferous invasion. All the montane grasslands were seriously degraded due to over grazing by sheep, drought tolerant conifers more easily gained a foot hold when lower numbers of cattle replaced the sheep. Figure 3 illustrates the reduction in montane grassland area between 1935 and 1981. The east face of Cerro Grande is characterized by ponderosa pine as a dominant overstory species, with denser midstory Douglas fir, pine and oakbrush (Quercus gambelii) at midslope and extending into the Frijoles drainage; understory consists of forbs (wildflowers) shrubs and grasses dominated by Thurber fescue (Festuca thurberi).

The west aspect consists of ponderosa pine dominating the upper slopes, with stringers of aspen with grass-forb understory. On the lower slopes, oakbrush patches grade in with ponderosa. Some mixed conifer stringers extend upward following the east fork (headwaters). Cerro Grande is a vital ecological complex. As habitat for turkey and blue grouse, a variety of rodents and many other small and large animals, and a population of raptors, the need to restore and maintain a healthy ground cover remains critical to keeping the necessary balance.

Historical fires evidently ran upslope (or backed downslope in some cases) to the ridgecrest where normally they slowed or ceased spread in the spruce stands which occupy the north aspect of Cerro Grande. An eleven year mean fire interval occurred prior to 1900. Due to the absence of periodic fire on Cerro Grande in the 20th Century, conifer establishment and density has increased unimpeded. Needle cast and dense shading have contributed to the overall decline in vigor of the native grasses in the forest understory. The meadows of the lower Cerro Grande are thought to be more mesic in character. Since the advent of aggressive suppression policies following the turn of the century, there has been a serious encroachment of conifer species on the once moist meadows. This has resulted in depletion of soil moisture by the transpiration of trees, enhancing the drying of these meadows and further encouraging tree invasion.

That portion of forested flats below Cerro Grande covers the mesatop bounded on the north by State Route 4, the flats on the west and east sides of Upper Frijoles Canyon to the park boundaries, and on the east by the NW-SE trending drainage which bisects Apache Mesa. This area consists of mixed conifer (Douglas & white fir, ponderosa pine, limber pine) and aspen overstory, with fir-pine midstory

Figure 2. Changes in Montane Grassland Area, 1935 to 1981, Jemez Mountains, New Mexico.



and understory. The ground cover is grass dominated, with forbs scattered about. There is also a remnant old growth snag population in the overstory which serves as habitat for a variety of bird and rodent species. Records indicate this area was harvested between 30 and 60 years ago. This activity left resultant heavy loadings of rotted logs (primarily Douglas fir) often exceeding 40 in (1 m) in diameter. The absence of fire since the turn of the century has created a severe fire problem due to high crown-fire potential, along with negative effects on herbaceous species occupying the understory due to blockage of sunlight, water transpiration, and heavy needle litter buildup.

2. Frijoles Canyon Area

Located within Frijoles Canyon, this area extends from the headwaters to Lower Frijoles Falls.

The vegetation is rich, varied and relatively dense; mixed conifer dominates the overstory and much of the mid-story, with several hardwood species occurring in patches near the streamside. Dense shrubs, forbs, and grasses occur along with heavy litter and branchwood which contribute to the surface fuel strata.

The lower reaches of this unit were treated with prescribed fire, and consequently some leftover burned woody debris remains. The upper inner-canyon areas have not been burned largely since the 1977 La Mesa Fire. Fire history chronologies for canyon wall portions of this area are incomplete; however, Allen (1989) reports that fires typically spread down into the canyon bottom from adjacent mesatops, resulting in widespread fires with a mean fire interval of 11 years. The last major fire to burn through Upper Frijoles Canyon was 1893.

The fuel loadings in this area are such that extreme fireline intensities with high energy release could result; and under severe wildfire conditions, extreme resistance to control could be expected once a fire front reaches the steep slopes (40-60%) on either canyon wall. The canyon area below Upper Crossing consists of mixed-conifer overstory with cottonwood, boxelder and alder dominating the midstory along the streamcourse.

Grasses, forbs and low shrubs constitute the live understory vegetation. Dead/down fuels are a complex of branchwood, large logs, needle, leaf and herbaceous litter with areas of duff extending to 6-8 in (15-20 cm) below litter surface. Surface fuels can accumulate in the canyon bottom comparatively faster than the adjacent mesatops due to the high productivity of the riparian environment.

3. Burnt-Escobas Mesas, mesas south to the monument boundary

This area is described as largely ponderosa pine-gambel oak with some piñon-juniper woodland on the eastern-most extent. Much of this unit was moderately to severely burned over during the 1977 La Mesa Fire and/or the 1996 Dome Fire. Therefore many areas are in the process of recovery through primary successional vegetative establishment. Grasslands, oak shrubfields, and ponderosa pine savannahs now dominate much of the [La Mesa fire] area. The Dome fire, which burned 4,779 acres of Bandelier landscape, included several areas of severe burn intensity where all surface vegetation was consumed on the higher slopes just west of upper Capulin Canyon.

Large ungulate grazing has had a significant impact on fire's ability to carry on the surface. There are locations which contain remnant arrays of large, often pitchy downed fuels.

The phenomenon of allelopathy, the chemical inhibition of one plant by another, is a means of restricting establishment of potential competitors (Evans, 1988). Foliage and competition from piñon and juniper prevent understory herbaceous growth in wide areas of the monument. Without this herbaceous component, fire's ability to spread is severely restricted.

4. Canyon bottoms of Lummis, Alamo, and Capulin; Portions of Medio, Sanchez, and Whiterock Canyons

Canyon bottom vegetation for nearly the entire length of Capulin Canyon was affected to differing degrees by the 1996 Dome fire. Ground fuels in upper Capulin were heavy, contributing in several locations to high intensity fire and loss of both ground fuels and standing live midstory and overstory. In the more xeric areas, vegetation and fuels were more discontinuous and therefore were subjected to light surface fire. Capulin Canyon bottom will pass through several years of successional vegetative phases. However, the rate of overall vegetational recovery will be largely dependent on moisture availability from both streamflow and precipitation patterns.

Whiterock Canyon hosts largely riverine vegetation: New Mexico Olive (Forestiera neomexicana), juniper (Juniperus sp.), and sagebrush (Salvia sp.), and herbaceous ground cover. Although fire does not play a distinct role in shaping vegetation, this area can support fire when large amounts of floodwater debris and drowned plants occur near river level.

5. Tsankawi area

This 800-acre detached section of the monument supports primarily piñon-juniper association with scattered ponderosa pine in the arroyo bottoms. Light, patchy ground fuels separated by rock outcroppings will result in limited spread low intensity fire, likely to burn only under the driest and windiest of conditions.

D. Fauna

Bandelier supports habitat for a wide variety of animal species, including approximately 1000 known arthropods, 5 amphibians, 14 reptiles, 44 mammals including 5 species of bats.

About 115 bird species and 90 species of ants have been recorded in and around the park area (Allen, 1989). A species list of fauna is located in Appendix L.

There is also habitat within the park which supports a variety of listed threatened and endangered species.

The state listed endangered (& Federal Category 2, under review for listing) Jemez Mountains salamander (Plethodon neomexicana) may occupy habitat within the park. Bandelier also supports habitat for the bald eagle (Haliaeetus leucocephalus), peregrine falcon (Falco peregrinus), (endangered), and the Mexican spotted owl (Strix occidentalis lucida), (threatened), (Allen, 1989). The southwestern willow flycatcher, Empidonax trailii estimus, is listed as endangered.

E. Cultural Resources

There are 31 historic structures and more than 300 pieces of handmade Pueblo Revival furniture dating to the Civilian Conservation Corps (CCC) era among the historic resources of the monument. The structures represent the most complete assemblage of CCC architecture in the country and as a Historic District, achieved National Landmark status on May 28, 1987. An estimated 6,000 archaeological sites ranging from simple lithic scatters to complex structural sites representing several periods are found within the monument. These sites date largely from 1100-1600 A.D., and comprise one of the largest concentrations of sites in the National Park System. A four-year field survey has been completed which sampled approximately forty percent of the monument land area. In addition, survey work associated with the rehabilitation of the 1996 Dome fire resulted in additional site recordings, and are listed in the monument GIS.

The monument contains a historic orchard planted by Judge Abbot in 1913, and is located just west of the ruins at Tyuonyi. Management objectives for the orchard

are to maintain genetic strains (to the extent possible) and the overall historic features of the area.

The 4,234 ac (1,714 ha) Cañada de Cochiti Grant located on the monument's southern boundary, has been authorized for addition to the monument. This tract contains the remains of a hispanic village established circa 1728, as well as several earlier Ancestral Puebloan sites.

F. Air Quality

Bandelier's 23,267 ac (9423 ha) Wilderness is protected under Class I Air Quality Standards as directed by the Clean Air Act and Amendments (1972, 1977, and 1990). As such, the monument must maintain the highest levels of protection from pollutants and visibility degradation.

Protection of visibility in Class I areas such as the Bandelier Wilderness is an important aspect of the PSD (Prevention of Significant Deterioration) section of the Act. The Act also sets a broad goal to prevent any future impairment of visibility. Although prescribed fire is defined as a "temporary" source of air pollution, state and local laws may apply under the general category of "open controlled burning". Specific New Mexico State air quality guidelines for prescribed fire smoke and smoke management procedures are contained in the Air Quality/Smoke Management Guidelines (Chapter VIII). For reference, see the Memorandum of Understanding, New Mexico Smoke Management (rev. 1997), Appendix F.

G. Water Resources

Natural water within the monument is limited largely to springs, seeps and perennial and intermittent streams. Several old stock ponds occur in the 1977 acquisition tract, within the upper Frijoles drainage. These ponds are designated for removal and reclamation in the 1995 Resources Management Plan.

Frijoles Creek is a perennial second-order stream which flows in its entirety within the monument. It can provide water for fire management operations anywhere along its length; summer flow varies from 3-15 cubic ft/sec (cfs). Alamo Creek can be intermittent over its total length, depending on summer precipitation amounts. As such, it cannot be counted on to provide a consistent source of water for wildland fire operations. Capulin Creek will remain an unstable and variable flow watercourse for several years due to the effects of the Dome fire. Other canyons (i.e., Medio and Sanchez) within the monument carry only storm runoff, mainly during July and August.

H. Human Uses

The following section briefly describes the evolution of human use of the Bandelier area, with the intention of characterizing how these uses contributed to shaping many of today's vegetative communities. These communities in turn defined fuels mosaics and attendant fire behavior patterns.

The early (or archaic) period began approximately 7500 years ago, and is thought to mark the beginnings of human agricultural activity in the area, replacing or supplementing hunting and gathering. The Ancestral Puebloan peoples began settlement on the Pajarito Plateau about 1100 AD, with population increases on the plateau during the 13th century.

One of the many human uses which had a major effect on the vegetative structure of the area was domestic livestock grazing, which occurred between 1860 and 1932, with particularly heavy grazing in the late 1880's (Allen, 1989.)

Fire history and other studies have shown (Swetnam, 1989 and Allen, 1989) that land use patterns from the 1890's forward, combined with a policy of total fire suppression beginning in the 1910's, constituted an alteration of the ecosystem unparalleled in human history of this region. See Chapter IV for further discussion.

The Santa Fe National Forest began administering the newly created Bandelier National Monument in 1916, promoting multiple-use of the monument's natural resources. In 1932, the monument was transferred to the National Park Service, and all resource use-based activities ceased at that time.

Another significant influence was the beginning of the Department of Energy's Los Alamos Scientific Laboratory in 1943. The growth and development of this facility to the present has greatly increased the potential for wildfires originating on monument lands to threaten highly sensitive technical areas.

A review of total monument visitation trends reveals a annual increase for the last decade of just over 10% per year. The 1993 total visitation was 367,478; 1994 visitation totaled 430,978 (with a slight decline to 396,517 in 1995). If this increase in monument visitation continues, there is a higher probability of human-caused ignitions particularly in and around developed areas.

IV. The Historic Role of Fire in Bandelier and the Jemez Mountains

The following sections describe how Bandelier's ecosystems were affected by fire; through its former natural presence, its more recent absence, and from suppression activities.

A. Fire History

There is no conclusive scientific evidence that puebloan cultures of this region utilized fire in hunting or other activities; however, one historical (Komarek, 1969) account suggests that these early peoples recognized lightning fires as a "natural force" which enhanced wildlife habitat and often checked outbreaks of insects and disease.

The southwestern United States has led the nation in average number of lightning fires each year. This vigorous fire regime ensues from an annual cycle of a variably wet cool season, a normally arid foresummer, and isolated lightning storms ushering the onset of the summer monsoonal rains. Lightning fires begin in the early spring and peak in late June to early July and decrease significantly as the summer rainy season progresses. Local surface burns are recorded as fire scars in tree rings, which allows simultaneous evaluation along with climatic patterns (Swetnam and Betancourt, 1990).

In terms of monument fire history, Caprio, et al (1989) reports that the Frijoles watershed has an active fire event record, the study points out that fire was a common occurrence throughout the watershed prior to 1900. Also of note is the notion that fires could occur commonly in different parts of the Frijoles watershed within the same year. Allen (1989) reports that for this entire watershed, the mean fire interval (i.e., a fire occurring somewhere on the study area) pre-1900 for all sampled cross-sections combined, ranged from 4 to 13 years. Extensive fires burned across the sample area in 1684, 1709, 1725, 1737, 1773, 1814, 1822, and 1842. Most of these watershed-wide type fires diminished after 1851, except one which occurred in 1899. The average frequency for all fire history studies for all sample areas (ponderosa pine-mixed conifer overstory type) is one fire in 10 years during the 18th and 19th centuries. The pattern for the 20th century is a different story entirely.

Seasonality of past fires is also important. According to Allen (1989), dormant season (i.e., late September-April) scars represented 33% of the total scars recorded (figure 3). Following this is 45% for May-June (18% early-earlywood,

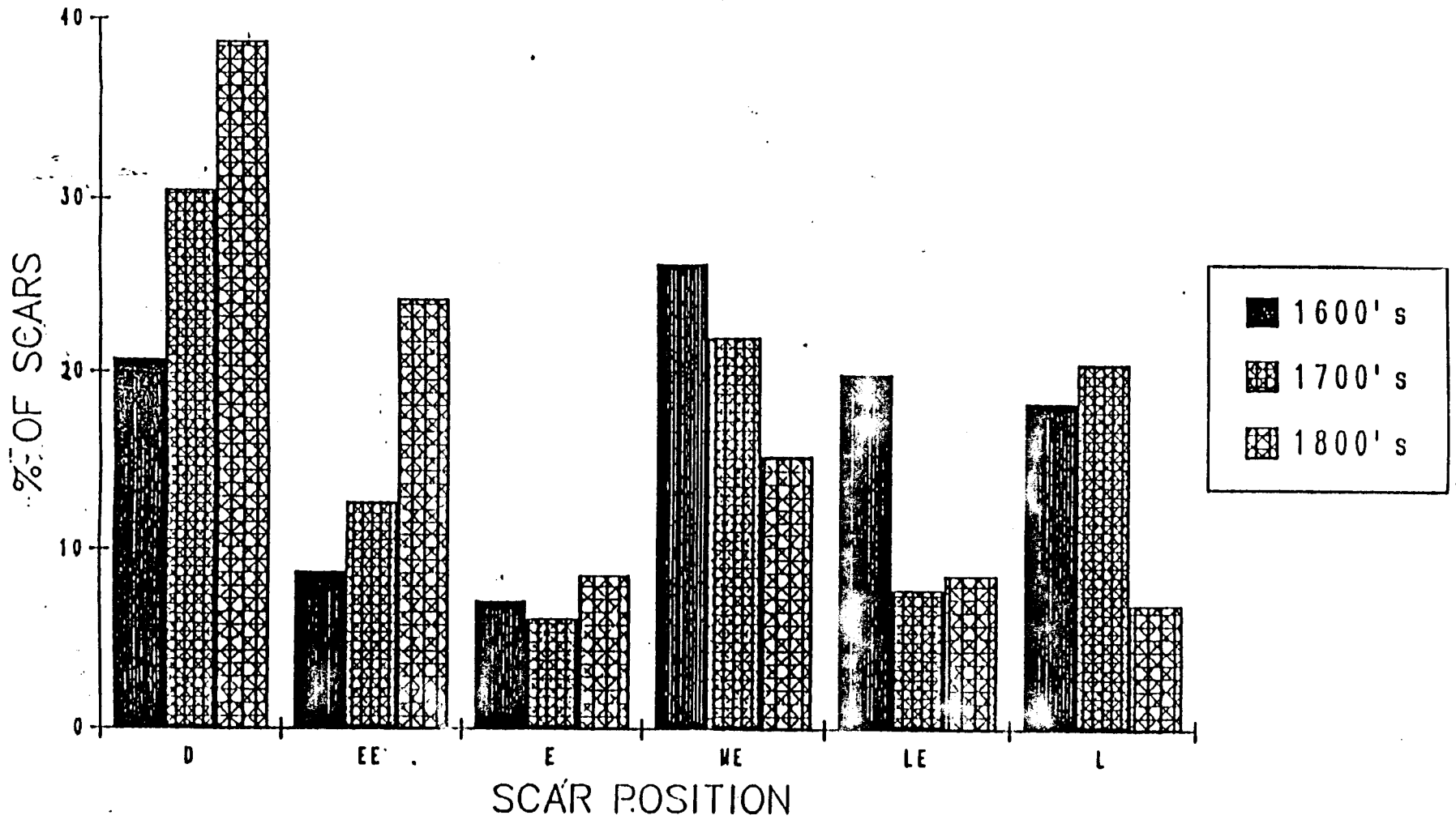
8% earlywood, 19% mid earlywood), and 22% in late-early and latewood. These percentages correspond somewhat closely to local seasonal lightning patterns (Figure 3).

As shown on Figure 4, fire occurrence was drastically reduced starting at the turn of the century. Likely the result of steadily increasing human settlement and activities requiring fire protection, this marked the beginning of simultaneous decline of "free burning" wildfires and consequent steady annual increase in forest debris (i.e., fuels) accumulations, even-aged forest structure, and decline of fire-dependent species.

Figure 5 displays current size-class distributions for the mixed conifer cover type at one location. This is illustrative of a stand structure severely altered due to the absence of stand regulating fire. Allen (1989) also discusses the increases in the density of local ponderosa pine forests. Figure 6 displays the size-class structure on a Research Natural Area on National Forest lands approximately 18-6 mi (30 km) west of the monument. Here, the two-tiered stand shows an old growth density of 45.5 stem/ac (100 stems/ha), with an understory thicket of stagnant saplings and poles which raises the total stand density to 9826 stem/ac (21,617 stems/ha). This condition sharply raises the potential for destructive, difficult to control crown fire. Such was the case in 1977 when the monument's ponderosa pine zone was suddenly and severely altered by the La Mesa fire. Changes in stand densities noted above largely led to this devastating fire, a largely unnatural crown-type fire which took out much of Bandelier's extremely overstocked ponderosa forest within a few days. Total fuel load in the fire area ranged from 16-25 ton/acre (35,840-56,000 kg/ha), which is considered moderate to high for this forest type. However, current fuels complexes weigh in at 25-45 tons/acre (56,000-100,800 kg/ha) within the higher elevation mixed conifer forest.

Another such event leading to vegetative cover alteration of over 16,000 acres of Santa Fe National Forest and Bandelier National Monument was the Dome fire in 1996. A human-caused start in late April, this fire occurred in high fire severity conditions resulting from an unusually dry and windy early spring. Although crownfire behavior was the rule over the upper Capulin watershed on National Forest lands, the monument by contrast was affected by lower to moderate fire intensities not unlike many management-ignited prescribed fires. This was mainly due to changes in vegetative composition and structure, however.

Figure 3 Relative scar position by century for all fire scars, 1600-1899.



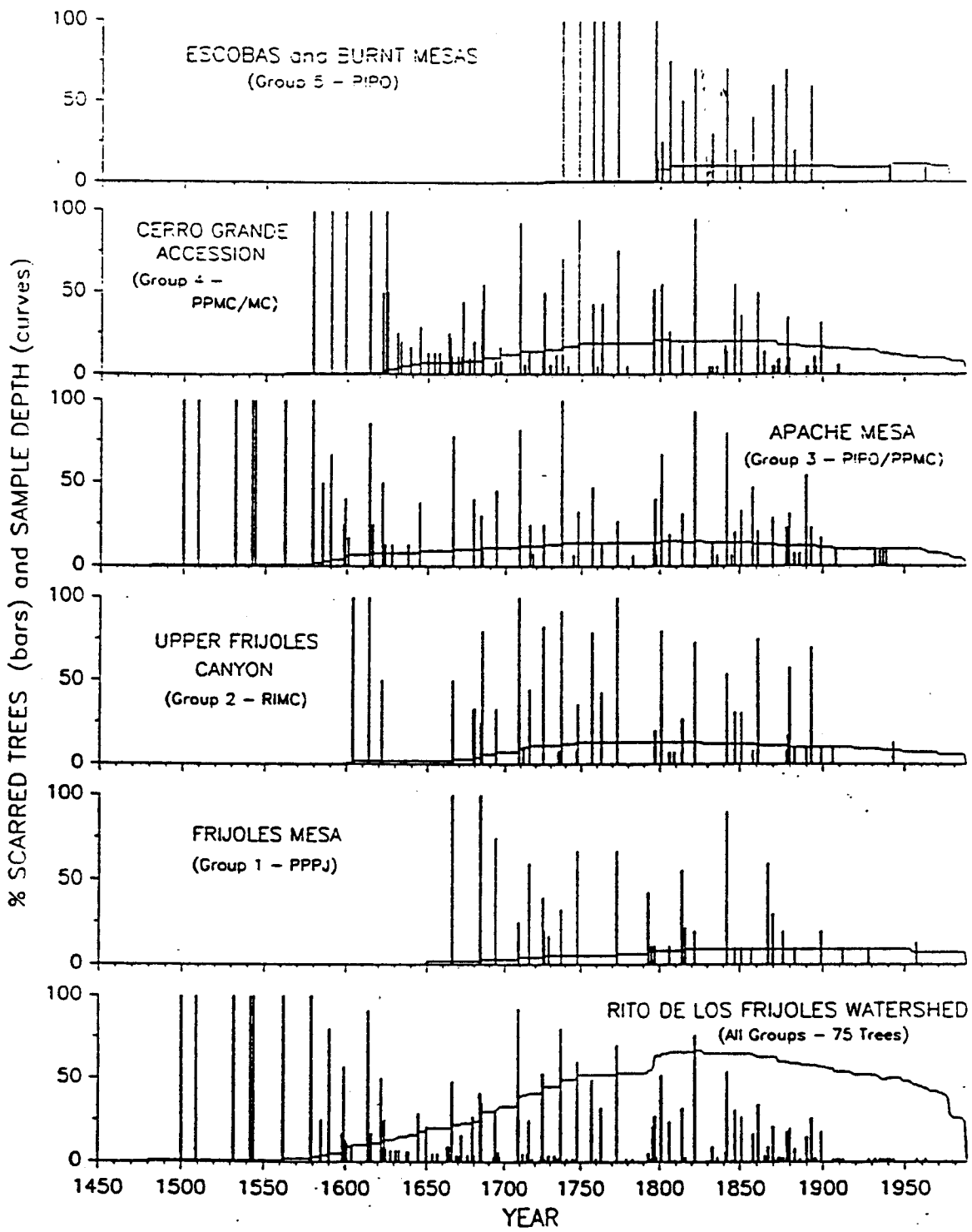


Figure 4. Frijoles Watershed Fire History.

FIGURE 5. Mixed conifer forest size-class distribution near sample point #471, Cerro Grande slopes.

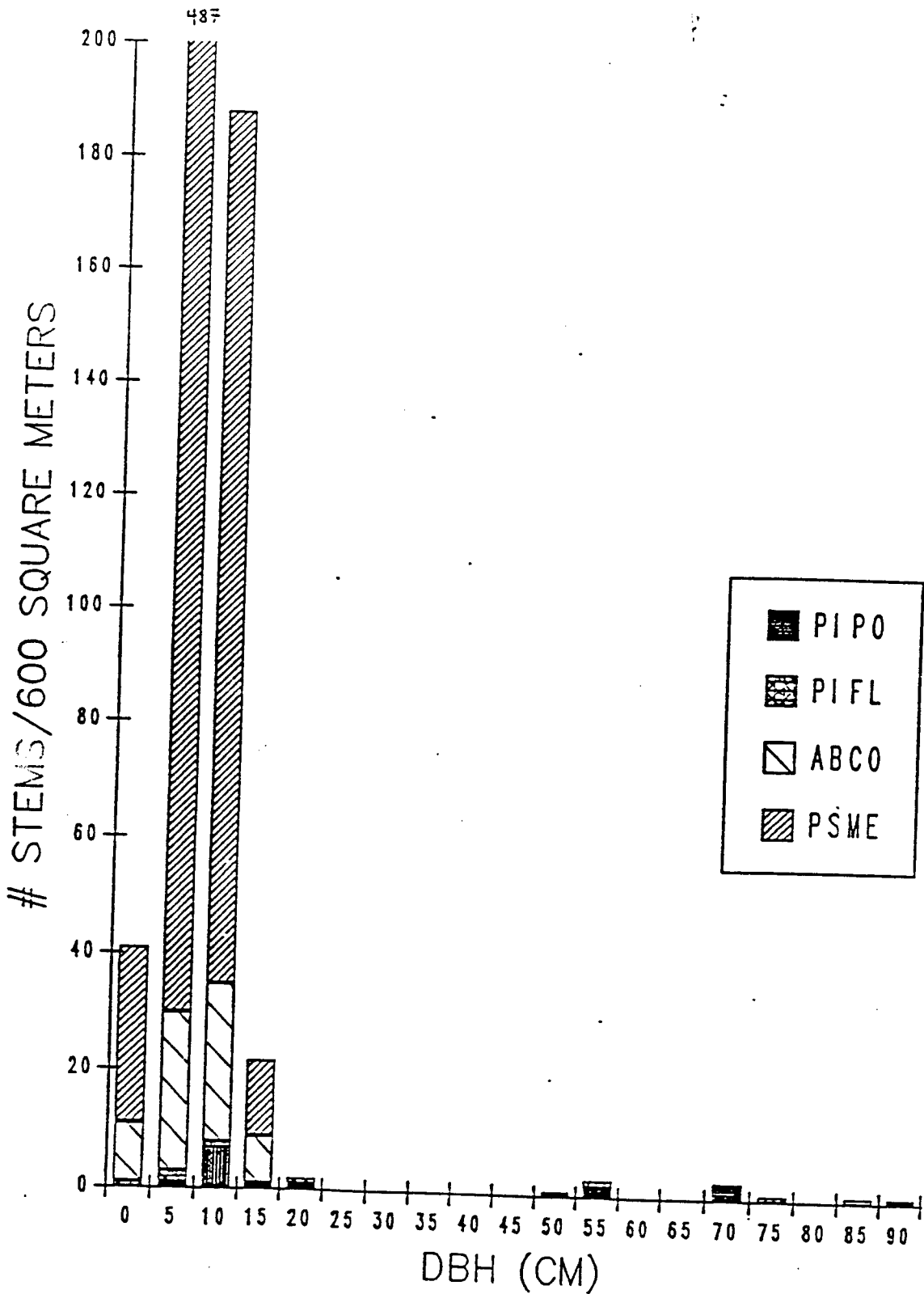
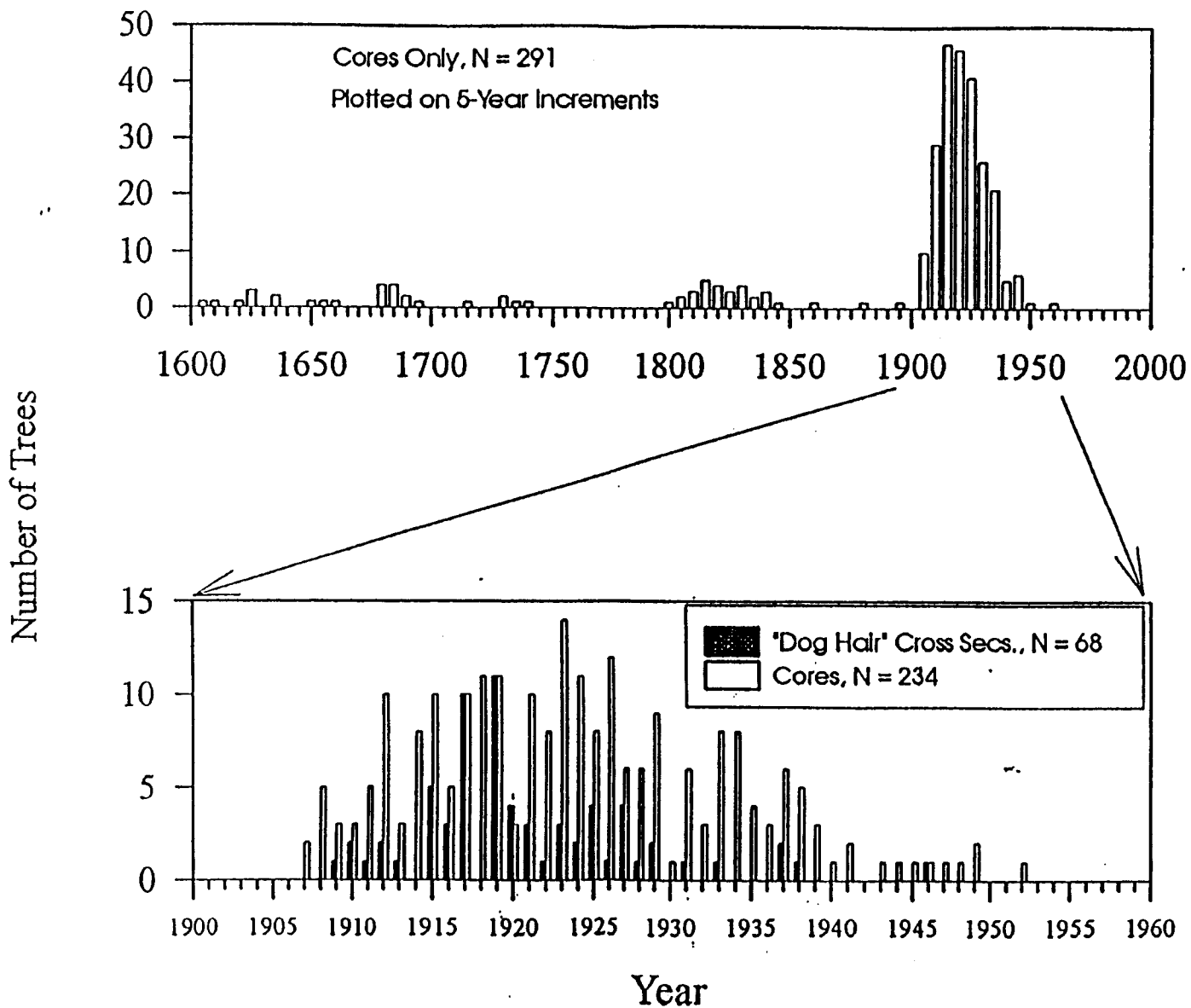


Figure 6. Ponderosa pine recruitment dates from Monument Canyon RNA. Dates are estimated from increment cores from living trees over 10 cm dbh, and from cross sections taken at the root crown from poles in dog hair thickets. Since increment cores were taken near ground level, but often did not intercept the pith, these dates are considered less accurate than dates from cross sections.



B. Fuels

Fuels represented within the primary vegetation types have been sampled (Allen, 1987, and Forester, 1979). Although fuel loads vary widely because of history of burns, elevation, aspect, growing season, etc., the following table represents an overall view:

<u>VEGETATION TYPE</u>	<u>RANGE OF FUEL LOADING(TONS/ACRE)</u> (Represents estimates based on sample inventories.)
Subalpine Meadow/Forest	0-10 tons/acre (0-22,400kg/ha)
Mixed Conifer	20-45 tons/acre (44,800-100,800kg/ha)
Ponderosa Pine	10-15 tons/acre (22,400-33,600kg/ha)
Piñon-Juniper Woodland	0-10 tons/acre (0-22,400kg/ha)
Riparian Woodland	10-30 tons/acre (22,400-67,200kg/ha)

Effects of fire on nutrient cycling pathways is an important dynamic in discussing fuels. One dynamic is the action of monoterpenes. During a fire, nutrients incorporated in vegetation, litter and soil can potentially be volatilized during combustion, mineralized during oxidation, or lost by ash convection (Grier, 1975). Nitrogen is often the nutrient limiting production in conifer forests. Fire acts as a mineralizing agent, releasing nutrients in available forms. However, nitrogen is lost during fires, which can further deplete this limiting nutrient. Without fire, nitrogen becomes tied up in partially decomposed litter (needles and woody debris). The problems faced by managers of these forest systems are how and when to use fire from a nutrient perspective. Nitrogen mineralization and nitrification patterns were higher in sites recently burned (within two years) and were lowest in sites without fire since the 1890's. Within a site, concentrations of certain monoterpenes were consistently negatively correlated with rates nitrification and mineralization. In these systems, fire promotes more rapid cycling of nitrogen, in part through combustion of monoterpene inhibitors (White, 1994).

A map of fuel models of the monument is located in Appendix D.

V. Fire Management Strategies

The park will employ (1) a suppression strategy to accomplish human safety and resource protection objectives; and (2) prescribed fire as a strategy to meet the other resource objectives stated in chapter II.

A. Wildfire Suppression

All declared wildfires will be suppressed in the monument... "at minimum cost consistent with the values at risk while minimizing the impacts from suppression activities" (NPS-18). In the Suppression Zone, all unwanted ignitions will be suppressed by employing a response appropriate to the conditions, with costs being commensurate with values at risk.

In the PNF Zone, should suppression of a declared wildfire become necessary, the initial strategy would be selected similar to that described for the suppression zone.

A map of the two Fire Management Zones is found on the inside back cover of this plan and discussed in this section, part C.

B. Prescribed Fire Management

The monument will employ Management Ignited Prescribed Fire (MIPF) to achieve objectives stated in Chapter II. Strategies to achieve objectives are outlined below and expanded on in Chapter VIII.

Prescribed Natural Fires (PNF), ignited by natural means (usually lightning), will be permitted to burn in the designated zone under specific environmental conditions with adequate management personnel and support available to achieve defined objectives. (See Fire Management Zone Map.)

C. Fire Management Zones

Under this plan, and for purposes of guiding management of fire in and around values at risk, the monument is subdivided into two areas (or "zones") where similar strategies are employed. These zones include (1) Full Suppression; (2) Prescribed Natural Fire.

1. Suppression Zone

This zone consists of three major geographic areas of the monument:

(1) The visitor center, headquarters and mesa developed area. This zone also includes major trailheads from the Frijoles Canyon Headquarters area. These features, along with attendant utilities, large cultural sites and other values are at risk for potential damage or destruction resulting from unwanted wildfire.

(2) Apache Mesa, west of the Upper Frijoles Crossing trail and the entire 1977 acquisition area of Upper Frijoles watershed.

(3) The detached Tsankawi Section.

All ignitions within the boundaries of the suppression zone will be declared wildfires and will be suppressed. However, management-ignited prescribed fires (MIPF) will continue to be utilized for purposes of hazard fuels reduction and resources management.

2. Prescribed Natural Fire Zone

The Prescribed Natural Fire Zone includes all of the remaining monument lands. This zone lies south of State Route 4 between the Ponderosa Campground and approximately one mile west of the Bandelier Entrance Station (see Appendix D). In addition, the mesas between Frijoles and Alamo Canyons, along with all land south of Alamo Canyon to the monument boundary is included within this Zone.

The strategy employed within this Zone is prescribed natural fire for all natural ignitions which meet prescription parameters (see Appendix I).

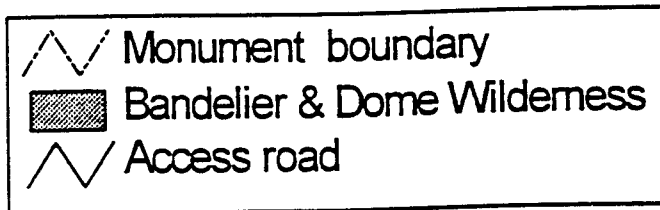
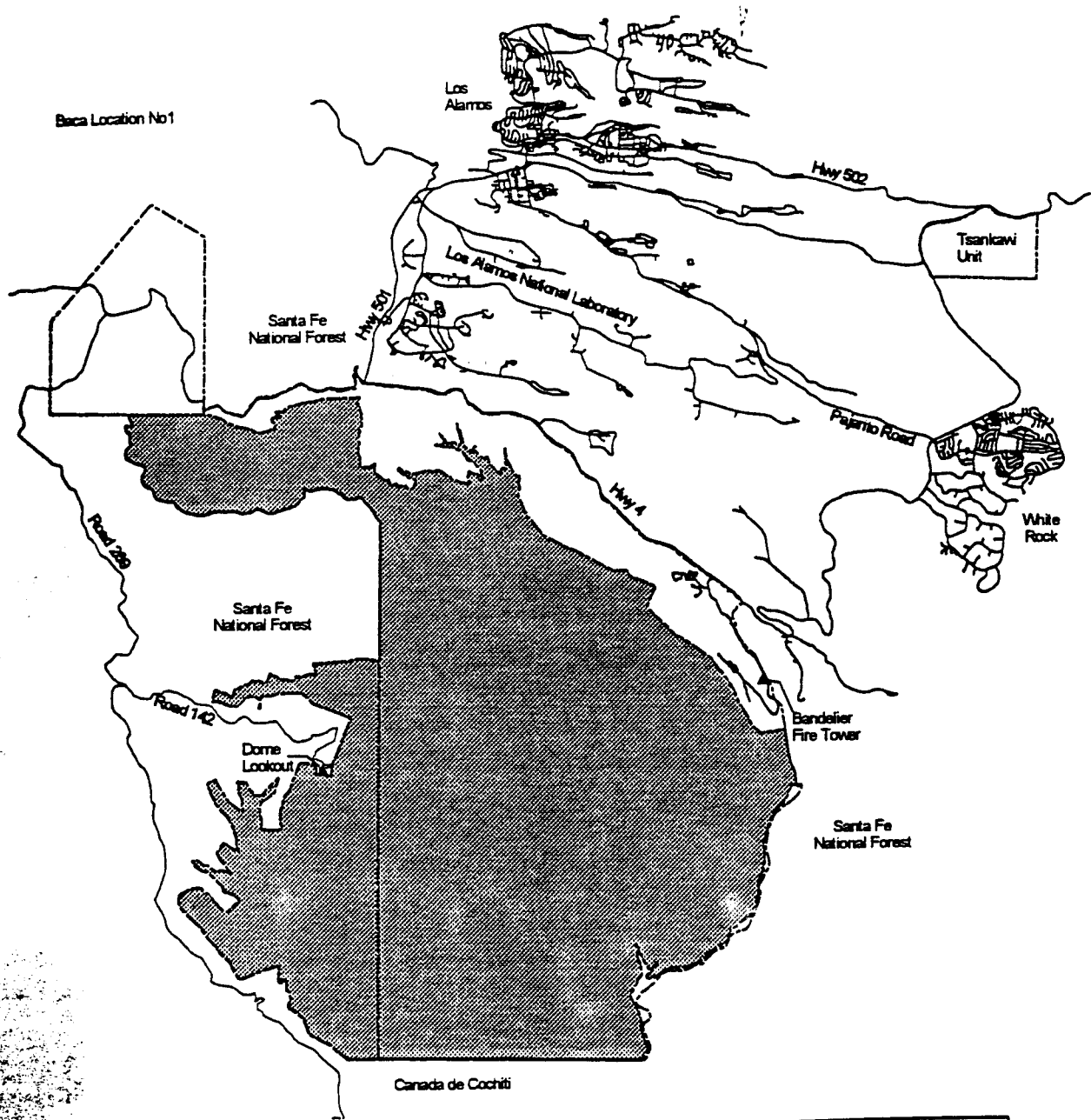
See detailed discussion regarding PNF in Chapter VIII.

D. Management Constraints

1. Chemical Retardants

Chemical retardants will not be routinely used. However, when authorized by the Superintendent, only fugitive dye type retardant will be allowed. The Chief of Resources Management should approve the use of any chemical retardants considered in suppression operations.

Bandelier National Monument and Vicinity



2. Dozers

Dozers are prohibited within the monument wilderness. Dozers may be used outside wilderness only if the fire is life threatening, and if the dozer is accompanied by a designated resource advisor for the monument, and with written approval from the Superintendent.

3. Sensitive areas or species

Sensitive areas or species (particularly threatened, endangered or candidate) in the monument will be protected from suppression activities. These areas/habitats will be included in documents such as the line officers briefing statement, prescribed burn plans, or pre-attack plans/Escaped Fire Situation Analyses. A natural and/or cultural resource advisor from the monument must be attached to the incident overhead team.

E. Fire Management Committee

The monument Fire Management Committee (FMC) is an in-house review and advisory body for the Superintendent. Consisting of the FMO (Chair), Chief, Resource Management, Research Ecologist, Biological Resources Division (USGS), and the Superintendent.

Generally, the role and function of this committee is (1) advisory to the Superintendent regarding fire management policy (including budget and fiscal) and program direction; (2) to provide a forum of discussion regarding major operational issues in fire management; (3) to recommend changes or new initiatives in areas of fire research themes, developing partnerships with other parks, brokering fire management expertise where appropriate with other areas or agencies; and (4) to review past fire management activities (MIPF, PNF, suppression, etc.) and develop new or efficient ways to improve program management.

The committee will meet at least annually during the spring (February or March), with the meeting agenda developed by the FMO with member input prior to the planned meeting.

A joint BAND-ELMA Fire Management Committee meeting will be arranged by the Area FMO as needed to discuss areas of mutual concern to both parks.

VI. Wildfire Program

This chapter discusses the major elements of a total program aimed at prevention and suppression of wildfires in and around the monument. This program will outline prevention, potential fire behavior, presuppression and emergency presuppression activities and funding, detection, suppression operations, and rehabilitation. Necessary records and reporting requirements are also covered.

A. Fire prevention

This section summarizes objectives and lists general action items established from the fire prevention analysis process.

Wildfire prevention efforts are directed toward ignitions which pose the greatest potential to cause unacceptable injury or loss to human life as highest priority; and secondly, the prevention of damage or loss to resource values.

Included in monument resource values are the following:

- visitor facilities: including two campgrounds, roads, trails, visitor center, contact station (Tsankawi section), and amphitheater; flush and pit toilets, fences, park radio repeater sites, and sewage lagoons;
- administrative facilities: including four housing areas, offices, three maintenance work areas, two corrals, a back-country cabin, and staff vehicles;
- cultural resources: including archaeological sites, historic landscapes, a historic CCC district, and collections;
- Congressionally designated wilderness;
- natural resources: including altered vegetative communities due to fire exclusion and past land use practices, restricted plant/animal species, and high "fire hazard potential" areas.

The Fire Prevention Analysis and Action Plan is included in Appendix N; however, base maps, overlays, and Prevention Zone planning worksheets are located in the Fire Management Office. The prevention analysis guides the establishment of the objectives and general action items (listed below).

The Action Plan, which contains detailed actions, will be reviewed annually and updated if changes occur which alter one or more of the identified RISKS,

HAZARDS and/or VALUES; and consequently, if changes in management actions are indicated.

1. Objectives

Prevention objectives are listed in priority order, and will guide the Prevention Action Plan:

- To reduce the threat of human caused fires through visitor and employee educational programs;
- To reduce hazards which may threaten identified values at risk; and
- To integrate the prevention message into the monument's on-site and off-site interpretive programs.

2. General action items

The following action items have been identified as elements in the monument's overall fire prevention program. They have been developed from reference materials, including 10 years of historical human-caused fire data by location, ignition source and date. These fires are displayed on a basemap contained in Appendix N.

According to the human-caused wildfire occurrence data (source: DI-1202 Fire Reports, 1984-1994), two ignition sources are identified: campfires and smokers. The following general action items address both the primary sources and summarize general parkwide actions:

- a. A fire prevention message will be developed for the visitor center, fire tower, and entrance station.

Responsible person: Fire Management Officer (FMO), On-going

- b. Fire danger signs will be placed at the entrance station and campground kiosk during periods of staffing class III or higher.

Responsible person: Supervisory Forestry Technician, Annually

- c. The Monument Staffing Plan will call for increased fire prevention patrols during staffing level IV or higher.

Responsible person: Supervisory Forestry Technician, Annually

- d. Reduce hazardous fuels through use of management-ignited prescribed fire.

d. Reduce hazardous fuels through use of management-ignited prescribed fire.

Responsible person: Fire Management Officer, On-going

B. Presuppression

Responsibility for implementation of presuppression activities lies with the Supervisory Forestry Technician under the supervision of the Fire Management Officer.

1. Training, qualifications, and certification

Fire management has rapidly become a highly technical and professional field, requiring skilled and knowledgeable employees within the National Park Service. This section is intended to promote effective individual job performance within the suppression operation.

The monument fire training needs analysis is developed annually, and provides the information needed to determine which courses will be required, which employees are targeted to attend, and number of slots available per course. The courses identified are based on actual position needs and are reflected in the employee development plans. The numbers and levels of qualified employees will be guided by the FIREPRO analysis.

All fire training/performance assignments offered to monument personnel will be in accordance with current NPS Wildland Fire Qualifications and Certification System (WFQC System). Yearly updates, through training certificates and completed redcard submissions, occur for the Intermountain Region during January and February for permanents, April and June for the fire crew and seasonals from other sections. The Area FMO has the authority to issue red cards to all permanents and FIREPRO seasonals, and other seasonals on an as required basis. See also NPS-18. Training and Qualifications.

Each December, the FMO will issue a memo to all redcarded employees that the approved aerobic fitness test will be administered before February 15 of the following year. The fire Program Assistant will arrange testing and keep record of results. The fire Program Assistant will establish and maintain updated files (folder and SACS) for each fire-qualified individual, listing training and experience completed.

A training needs assessment will be conducted by the FMO during the month of July. Courses and trainee assignments required to meet position needs the monument (see below) will follow FIREPRO, Region and monument guidelines.

The FMO shall seek clearance from cultural and/or natural resources branches for any monument area for which training field exercises will be conducted involving potential impacts to resources (i.e., exercises involving chainsaw use, engine operations, aircraft use, etc.)

Position needs (determined by FIREPRO analysis for monument and national program) are listed below. This plan assumes the position will receive prerequisite training and experience for the target job identified.

Training needs: Suppression

<u>Position</u>	<u>Target job</u>	<u>Target date</u>
Chief, RM	FBAN/PSC2	12-98
FMO	PSC2	12-98
Supervisory Forestry Technician	OSC2 ATGS	12-98 12-98
Fire Program Assistant	EMTB MEDL	recertify biannually recertify annually
PFSM Leader	TBA	
PFSM Asst. Leader	CRWB	12-98
Engine Foreman	ICT4/CRWB	recertify
Archaeologist	Resource Advisor	¹
Plant/Animal Specialists	Resource Advisor	¹

¹ Must be certified as a Firefighter to be able to go out on the fireline.

Training needs: Prescribed Fire

<u>Position</u>	<u>Target job</u>	<u>Target date</u>
Chief, RM	RXB	recertify
FMO	TBA	
Supervisory Forestry Technician	RXI1	12-98
	RXM2	12-98
PFSM Leader	RXI1	12-97
PFSM Asst. Leader	RXI2	12-97
	RXFM	12-98
Engine Foreman	RXI2	12-97

2. National Fire Danger Ration System (NFDRS)

The normal fire season for Bandelier under FIREPRO is April 15-September 15. However, these dates are averages and periods of high fire danger can occur as early as March and as late as November.

The basis for most presuppression activities is the National Fire Danger Raging System, or NFDRS. This system requires a standardized entry of weather and fuel moisture parameters. Fire danger indices are calculated for stylized fuel models and provide the foundation for staffing activities illustrated in Appendix C.

There are three functioning weather stations in the monument: a primary standard station (290801; name: TOWER) located at the fire lookout tower, the readings from which provide the daily WIMS (Weather Information Management System) indices. A second RAWS station has been installed at the Ponderosa Campground, the data from which is accessible by computer download. The third station is sited above 9,100 ft. (2773 m) elevation in Sec. 27, T19N, R5E (data also available by computer download).

Weather observations are collected year around. By March 15, the thousand-hour time-lag fuel moisture is initially set and a new fuel stick sensor is installed. By April 1 the fuel stick season has seasoned for several weeks and readings are consistent.

A "Fire Weather Watch" is defined by the National Weather Service as a possible critical fire weather pattern. This can be brought on by winds, humidity, frontal activity, etc.

A "Red Flag Warning" is issued for an ongoing or imminent critical fire weather pattern. This is announced by the Santa Fe Zone Dispatcher (as is the Fire Weather Watch) during the daily weather broadcast.

C. Emergency Presuppression

1. Staffing plan

The chart (see Appendix C) was developed to direct incremental presuppression actions in response to increasing fire danger. It contains five staffing classes (1 - 5), which are approved for a burning period. Break points between classes are determined by cumulative percentages of occurrence of the ERC (Energy Release Component). The most critical break points occur at the 90th and 97th percentiles (automatically defined by the FIRDAT run), and define staffing classes 4 and 5 respectively.

2. Funding

These "emergency presuppression" accounts are available to open any time the staffing level reaches 4 or higher (and an FMO judgement call) to cover potential extra expenses. These may include extra workhours for the fire crew and overhead, hiring emergency firefighters, aerial reconnaissance etc. Extreme conditions due to fire weather watches or redflag warnings may also precipitate these actions, particularly when dry lightning activity is predicted.

D. Pre-attack plan

The monument pre-attack plan is intended as a way to assist monument fire management personnel in arriving at informed decisions, particularly (but not limited to) suppression actions. This plan is located in Appendix P. It documents such cumulative information as monument fuel types, values at risk, water sources, boundaries, potential control lines, incident base/camp locations, helispot locations, etc.

E. Detection and dispatch

Activities under this heading relate to surveillance of NPS and cooperating agency lands around the monument. The monument maintains a fire lookout, and funding is authorized under FIREPRO to staff the tower at management discretion.

A specific Standard Operating Procedure for the fire tower operation is located in Appendix E.

During declared fire season a daily roster of certified and available red carded personnel will be maintained by the Fire Program Assistant. The roster will be posted following appropriate clearances with the employee's supervisor and with the employee, listing where the employee is authorized to take assignment (i.e., monument, state, out-of-state, etc.), and will be in effect for a full 24 hour period. The employee, once on the call-out roster, is expected to be ready to travel within 2 hours of a dispatch call. The only out-of-monument wildfire dispatch calls accepted by the monument are from Santa Fe Zone. The monument FMO will coordinate all dispatches (including PNF), and arrange for transportation. Any changes in the employee's call-out status during this 24-hr "on-call" period must be made to the FMO immediately with adequate justification. If the FMO is unreachable for some reason, the Supervisory Forestry Technician will be notified. During periods of national fire emergency and/or staffing level 5, it is expected that all red-carded employees will be available for dispatch for the standard 21-day assignment (30 days for Alaska/Hawaii).

The monument engine (Engine 91) will be dispatched through Santa Fe Zone. Bandelier, plus areas under cooperative agreement (including Santa Fe National Forest and New Mexico State Forestry jurisdictions; See Appendix F), will be subject to initial attack action by Bandelier resources, with an immediate call to Santa Fe Zone Dispatch. Unless otherwise notified by dispatch or an appropriate agency representative, the duty engine foreman will assume the IC position on cooperating agency fires only through the initial attack phase. Dispatches of Engine 91 to all other fires will be through Santa Fe Zone, using procedures outlined in the "Santa Fe Zone Action Plan" (in FMO office, Bandelier NM).

For additional details on dispatch procedures, see the Southwest Area Mobilization Guide (Fire office) and monument fire SOP's (Appendix E).

F. Suppression

Chapter V ("Fire Management Strategies") briefly outlined appropriate suppression response actions for each management zone. This section further details suppression activities to be employed for declared wildfires.

There are three suppression strategies: confine, contain, and control. The objective of the confine strategy is to restrict the wildfire to pre-determined boundaries, established either prior to or during the fire. The objective of the contain strategy is to restrict the fire to a defined area, using a combination of natural and constructed barriers to stop the spread under prevailing and forecasted conditions, until out. The control strategy requires aggressively suppressing a wildfire by establishing firelines to prevent the fire's spread and to extinguish hot spots, etc. until out. The Escape Fire Situation Analysis (EFSA) is the fire suppression strategy decision document used by management, Appendix P.

The Fire Complexity Analysis (FCA) is a checklist intended to guide the Superintendent in determining when a transition from extended attack to a management team of higher level is necessary. It must be completed by the IC, FMO and Superintendent before additional resources are ordered. The FCA guide is contained in NPS-18, Section III, Chapter 8, Exhibit 4.

1. Interagency contacts and coordination

The monument actively coordinates with other agencies. Principle contacts are:

- Fire Management Officer, Jemez District, Santa Fe National Forest
- Fire Management Officer, Española District, Santa Fe National Forest
- Fire Staff, Santa Fe National Forest (Supervisor's Office)
- Fire Management Officer, Bernalillo District, New Mexico State Forestry
- Fire Management Officer, New Mexico State Forestry, Santa Fe
- Fire Management Officer, Eight Northern Pueblos, Bureau of Indian Affairs
- Fire Chief, Los Alamos County Fire Department
- Resident Manager, Corps of Engineers, Cochiti Reservoir
- Los Alamos Police Department (Shift Supervisor)
- Manager, Emergency Operations Center, Los Alamos National Laboratory

A listing of these contacts with addresses and phone numbers is in Appendix O.

Formal coordination is maintained through the various interagency agreements. The Joint Powers Agreements and Initial Attack Operating Plan, Santa Fe Unit is in place to provide mutual aid assistance among signatory agencies, using closest available resources concept. Under the agreement and operating plan (see map, Appendix F), Bandelier is responsible for initial attack action on over 40,000 ac (16,200 ha) of USFS and private lands bordering the monument.

There is also an agreement to provide extended attack management team services between Bandelier National Monument and the Santa Fe National Forest (Appendix F). Qualified personnel from both agencies serve on this team for extended attack.

2. Transition

If the incident increases in complexity and/or size, or escapes initial attack, the Incident Commander may be relieved by a higher qualified individual such as a Type II IC with or without appropriate team function heads. See "Interagency Agreement, Extended Attack Incident Management Team, Santa Fe NF and Bandelier National Monument", Appendix F.

The procedures for managing the transition between initial attack/extended attack organization and an interagency incident management team (Type III, II or I) are found under the Line Officers Delegation of Authority & Briefing Package, Appendix K. Emphasis will be given to suppression actions which maximize the protection of monument resources. This would include a designated National Park Service (NPS) agency or Superintendent's representative to attend all planning and strategy sessions; to deliver any pertinent information to personnel (including to Crew Boss level) during shift briefings; and to keep the Superintendent constantly informed of the situation and seeking decisions when required. The FMO or designee would normally assume this assignment.

G. Records and reports

Historic fire reports will be maintained in the monument archives, with a copy in the fire management office and limited entry into the SACS database. The Fire Atlas and associated fire records will be annually updated by December 15. The database will include: location, size, cause, duration, vegetative type, and event dates. A copy of all historic fire occurrence records will be forwarded to the monument curator for accession. All other documentation relating to fires, i.e., maps, photos, records will be assembled for accession to the library or historic collections, as appropriate.

A complete listing of required records and reports, frequency of preparation, responsibility and distribution is in Appendix E.

H. Rehabilitation

In situations where there were impacts to monument resources resulting from suppression actions and/or the fire itself, a rehabilitation plan of some degree may be indicated. If one is prepared, it should be initiated by a staff resource advisor, reviewed by the Fire Management Officer and Chief of Resources Management, and approved by the Superintendent.

A long term rehabilitation plan is prepared usually by a BAER (Burned Area Emergency Rehabilitation) team dispatched to the fire site. The 1996 Dome fire required such services, and a plan was prepared for implementation. In most cases, a two-year (two growing seasons) followup (beyond the fire "declared out" date) period is acceptable for parks to obligate approved funds for rehab purposes.

Specifications which must be followed when implementing emergency rehabilitation measures, are as follows:

1. RESEEDING is prohibited unless activity occurs within a developed area and is preapproved. Reseeding will be done only for human safety purposes or if it has been determined by the Superintendent that significant cultural resources are threatened by erosion. Reseeding specifications for rehabilitation purposes must be specifically approved in the monument's Vegetation Management Plan.
2. All REVEGETATION and/or LANDSCAPING is prohibited unless specified otherwise. A separate revegetation and/or landscape plan must be included in the long term Rehabilitation Plan approved for a fire.
3. MULCH is to be used only in conjunction with an approved reseeded program. Only native tree bark or rice straw is permitted, not to exceed 1500 lbs/acre (1500 kg/ha).
4. Biodegradable SOIL NETTING is permitted with prior approval of specifications and manufacturer information.
5. CHECK DAMS will be permitted only using logs or loose rock. The use of these materials will be justified and approved in the long-term Rehabilitation Plan. Generally, check dams will be constructed only on highly erodible soils in severely burned areas within the developed area of Frijoles Canyon.

The overriding philosophy of rehabilitation is that it be minimum treatment necessary for stabilization of the burn and other impacted areas and for the protection of cultural resources.

VII. Management Ignited Prescribed Fire Program

This chapter will outline the management ignited prescribed fire program, including procedures to follow to ensure that stated resource objectives are being accomplished consistent with management constraints.

A. Program overview and Ten-year Schedule

For the long-term, prescribed fire will be used extensively to maintain the historical fire return interval. These intervals will obviously vary due to the wide variation in historical fire size, intensity, and pattern of burns across the landscape. Management can then begin to adjust vegetative successional patterns back to the natural range of variation.

It is important to recognize how critical the treatment patterns will become; in other words, ignition and burn patterns should vary temporally and spatially across the landscape. Elevations, aspects and season of fires will be changed regularly to simulate pre-settlement fires. The sections describing resource objectives and strategies involving the application of prescribed fire provide the basis for establishing priorities for burning, and will drive management actions accordingly.

1. Management Ignited Prescribed Fire Units

The monument is divided into three major landform-referenced areas, each having numbered burn units. They are: "UF", Upper Frijoles (includes 1977 Acquisition, Apache Mesa, and Burnt and Escobas Mesas; "HQ", Headquarters (including administrative, residential and campground areas) and Frijoles Canyon from the Rio Grande to below Upper Crossing; "BW", Bandelier Wilderness. All burn units identified to date are listed in the ten-year Prescribed Fire Schedule and referenced to a map illustration (Appendix M).

A total of 27 prescribed fire units are identified to date. The units comprise approximately 35% of the total monument area. Boundaries of these units are in most cases simply fuel breaks (i.e., road, trail, rock, etc.). However, in areas such as in the 1977 Acquisition, fuel discontinuities do not exist and unit boundaries may require some holding line construction.

2. Ten-year Prescribed Fire Schedule and Unit Map (Appendix M)

The ten-year schedule calls for prescribed burning of between 700-2000 acres per year starting in the present year. The schedule is subject to periodic updates to provide currency for management.

This prioritized burn schedule is considered a best-case scenario. Hence, its accomplishment is contingent upon favorable prescription conditions during normal windows (March - November). The larger units will be treated using a combination of blackline, backing and/or flanking fire, and headfire according to terrain and fuel conditions. Aerial ignition will be a consideration, particularly for the larger units. Reburning of these units will be necessary to further reduce loadings and mid and/or overstory densities to more pre-settlement levels. Smaller units may also be designated for purposes of research or demonstration, and may be added to the schedule on an as needed basis.

3. Hazard fuel reduction

Many listed burn units are operationally identified as hazard fuel reduction projects. That is, these areas have met certain criteria such as treatment required to protect "values at risk". These values can be located, for example, in or around highly flammable concentrations of woody debris or unnatural densities of trees at any level in the overall forest structure. Another value at risk can be defined as ecological integrity of a vegetative community threatened by heavy fuel concentrations, or simply as the boundary with a neighboring agency.

Obviously, the hazard fuels reduction program takes the highest MIPF priority. However, as the program progresses and objectives are being met, this portion of the total prescribed fire program will begin to diminish.

4. Resource Management Prescribed Fire

This aspect of the management-ignited prescribed fire program emphasizes the accomplishment of stated resource objectives. This includes but is not limited to areas such as maintenance of fire regimes (i.e., following established fire return intervals); maintaining or re-establishing identified fire-dependent species or communities; manipulating forest structure and function; and supplementing approved forestry practices (i.e., maintaining meadows, alter erosional patterns, etc.).

B. Prescribed Fire training, certification, and organizational requirements

1. Positions

The following positions are identified as necessary to implement the prescribed fire (including PNF, see chapter VIII) program:

- 1 each Prescribed Fire Manager (type 1 and type 2)
- 1 each Burn Boss I certified to NFFL fuel Models 1, 2, 3, 8, 9, 10.
- 2 each Burn Boss II certified to NFFL fuel Models 1, 2, 3, 8, 9, 10.
- 2 each Ignition Specialist (type 1 & 2)
- 2 each Prescribed Fire Specialist
- 1 each Prescribed Fire Behavior Analyst
- 4 each Prescribed Fire Monitor
- 8 each Firefighters

(Note: Positions identified above can also be made available for assignment to requesting parks).

2. Training plan

See page 31.

C. Annual burn program management

By December 30 of each year, the FMO will review prescribed fires completed for the previous year. This review will include an analysis of objectives achieved and recommendations for refinement of burn prescriptions. The next year's annual burn plans will be prepared for review by the monument Environmental Compliance Committee and Fire Management Committee. Once approved by the Superintendent (generally by March 1), the burn plans become part of the Section annual workplan. The 10-year Management-Ignited Prescribed Fire Schedule will also be updated as needed.

1. Burn plan elements

In addition to the completion of the format prescribed in NPS-18 and found in Appendix H, each plan will have the following attachments:

- a. Application and Permit, Open Burning; included are data from the burn plan as an attachment. Smoke Vector Map and Smoke Estimation Model (SASEM) calculation (required).

Permit issued by the New Mexico State EID (Santa Fe Office).

- b. Section 106 Clearance (Triple-X)

Prepared by the burn boss; number assigned by Chief, Resources Management; reviewed/signed by Archaeologist and Superintendent.

- c. Record of Review of Activities for Natural Resource Impacts (NEPA); usually a categorical exclusion (Triple-Y).

Prepared by the burn boss and signed by Project Supervisor, submitted to and signed by all members of the Environmental Compliance Committee following review. Approval may only be granted by the Superintendent. Also addresses mitigation measures.

- d. Burn Specific Computations

For example, BEHAVE computations for scorch height, spread rates, etc.

- e. Raw Data and Data Summaries

- monitoring data/analyses
- spot forecasts
- weather observation forms

- f. Photographic records (video, 35 mm, etc.)

- g. Postburn Narrative (see Appendix H for example format)

2. Prescriptions

A prescription is a set of values which specify conditions under which fires can be ignited and managed to meet specified resource objectives. Due to seasonal variations, the prescriptions specified for prescribed fires at Bandelier are listed

under "spring" or "fall". Timing and patterns of ignition, spatial pattern, size, duration, behavior and return intervals all contribute to re-creating the complex fire mosaics on the landscape. Spring fires (normally March through June) can present potential complications for larger unit treatment, because weather can change within a few days. Dry winter fronts can produce high local winds which may affect control aspects of a multi-day prescribed fire, especially in the hazard fuels units. It is expected that some areas of large fires may be out of prescription on the low-range (i.e., "cool") side while other areas may actually exceed the upper limits for short periods of time.

The range of prescription elements are specified to give management a window or combination of fire behavior scenarios with which to achieve the burn objectives and ensure control-ability to the degree possible.

Most elements were derived from previous burning experience, the work of other fire managers in similar vegetative types, and literature review. They are designed to keep fire behavior within a "natural range" of intensities. However, in areas where the objective is to reduce mid-story tree density, for example, fires may need to be more intense to cause torching.

Prescriptions are found in Appendix I. They will be subject to continuous refinement, particularly when more information is learned about fire effects.

D. Prescribed Fire monitoring

Levels 1, 2, and 3 monitoring will follow the Fire Monitoring Handbook (FMH); level 4 (long-term monitoring) will follow the requirements of the Handbook with some special case studies possible.

E. Documentation requirements

1. Fire Report, DI-1202.

Required for all prescribed fires; signed and entered on the (SACS) within 5 days after the fire is declared out (burn boss).

2. Postburn narrative

Due with final fire package, within 30 days after fire is declared out (burn boss); also, entries on the SACS under "Project Accomplishment Report" screens

(remarks and cost data) are required once cost summaries are received from accounting.

3. Data

Monitoring data sheets are completed by the monitors and maintained by the resident monitor supervisor (New Mexico - West Texas Fire Monitoring Group).

4. Maps

Enter burn unit location into the Geographic Information System (GIS) (Supervisory Forestry Technician/Monitor Supervisor-GIS Operator).

5. Filing

Assemble final fire package and file in FMO office. Outline of package contents is found in the SOP binder, Fire Program Assistant's office.

F. Fire evaluation

The evaluation will be conducted by the FMO for the purpose of improving operations and procedures. In cases where the fire is declared a wildfire, separate review procedures are discussed briefly in Chapter XIII, Fire Critiques.

The fire evaluation format is found in Appendix H.

VIII. Prescribed Natural Fire Program

This section reviews guidelines to be followed in arriving at the decision to declare, and subsequently managing, prescribed natural fires. The previous discussion in chapter V briefly outlined the strategy for PNF within the designated zone.

A. Management guidelines for Prescribed Natural Fires (PNF)

A Fire Situation Analysis (FSA) will be prepared by the Burn Boss (or RXFM) for each PNF (except those posing no risk, surrounded by natural barriers) in the zone and will be recertified daily. All PNF's (except those surrounded by natural barriers and termed inconsequential) will receive daily monitoring to ensure compliance with the approved prescription.

The decision to classify a natural ignition as either PNF or wildfire will be made only by the Superintendent using the certification process.

The following guidelines will serve to ensure an orderly and safe management of all potential or on-going PNF.

1. The Superintendent has ultimate authority and responsibility for approving or disapproving PNF, including the continuation of same.
2. A Fire Situation Analysis (FSA) or similar approve document* (per NPS-18) shall be completed for each PNF by the RXB1, RXB2, or RXFM and approved by the Superintendent. The format for this analysis is found in NPS-18, Section III, Chapter 5, Exhibit 1. FSA Part 1 must be completed daily by the lead fire monitor and reviewed by the RXB1 (or RXB2), and a recommendation made to the Superintendent to continue or terminate the PNF. The Superintendent will document daily his/her decision with a signature on the NPS-PNF decision record (NPS-18, Section III, Chapter 5, Exhibit 2). This completed form must be held in a secure location as legal evidence of the decision.

*Note: The FSA is due to be replaced by an interagency PNF burnplan, subject to agency adoption in near future.
3. If any prescription parameter for a PNF in the zone in which the fire is located is exceeded for a period of four continuous hours, the PNF will be declared a wildfire.

4. If any PNF is spreading towards either of the other zones or other agency boundary, the Superintendent will be notified and the PNF will be re-evaluated. If holding actions cannot prevent the PNF from escaping these limits, or if any identified values at risk (i.e., cultural resources, administrative facilities, etc.) are threatened, the PNF will be declared a wildfire. If the guidelines established in the decision chart are exceeded, the PNF will be declared a wildfire and will be suppressed. All holding actions shall be subject to the application of minimum impact suppression techniques.
5. Any ignition classified as a PNF must also meet all criteria stated in the Southwest Area Preparedness Levels (Appendix I). (Note: this issue is under review for possible revision at the time of writing.)

Presently the criteria specify that any natural ignition occurring after the declaration of Southwest Area Preparedness Level IV or higher will be declared a wildfire, except those that are of "no significance or risk". For existing PNF, those designated under a lower preparedness level will continue to be managed as such unless the prescription or other decision criteria has been exceeded.

6. A Burn Permit will be obtained from the State Air Pollution Control Bureau for any PNF which is or may produce substantial volumes of smoke. (Note: this requirement is presently under review for possible revision.)
7. The allowable number of PNF's is determined by the monument's qualified staff capability to adequately manage each according to standards described in section (C) below. There now exists several national level (NPS) Prescribed Natural Fire Management teams which can be resource ordered to assist with complex and/or multiple PNF incidents.
8. Once any PNF is declared a wildfire, it cannot later be reclassified as a PNF.
9. Other considerations:
 - (a) According to the FSA, Part I, Section 7, any 24-hour weather forecast of sustained winds in excess of those in the approved prescription will prompt immediate suppression of all PNFs.
 - (b) If the assigned resource advisor for cultural resources determines that mitigation action for sites or features is required (i.e., fuel reduction or other protection measures) and documented in a XXX form, that holding resources be assigned immediately to accomplish this work under direction of the archaeologist (or whomever assigned).

(c) Most of the PNF zone is rugged and remote. Safety of all assigned personnel is of the highest priority; and as such, safety briefings will be held by the RXB1 or RXB2 (or designee) prior to any planned actions on PNF's.

B. Decision Chart for Prescribed Natural Fires

Fire Discovered

RXFM Team Assigned & Resource Advisor(s) notified for possible assignment
(FMO)

Fire recon info/FSA* Part I collected

Cause/Location determined

Natural: -----NO **Declare Wildfire**

Within PNF Zone? -----NO **Declare Wildfire**

FMO/RXM begins FSA (Parts I & II) & Complexity Analysis and Determines:

▶ In Prescription? -----NO **Declare Wildfire**

|| RXBB Available/Qualified? -----NO **Declare Wildfire**

|| Obtain Burn Permit

|| FMO/RXM completes/updates FSA & Complexity Analysis; identifies MMA;
|| briefs Ch. Res. Mgmt. & Supt.; Recommends that fire be managed as PNF

▲ FMO/RXM completes Resource Needs Assessment & prepares Assignment

|| Roster;
|| Social and political issues favorable to Supt.? -----NO **Declare Wildfire**

|| Superintendent signs FSA & PNF Decision Record; resources assigned/ordered

|| Manage as PNF (monitor per frequency requirements of Fire Monitoring
|| Handbook)

|| **RECERTIFY DAILY**

└─┘

*FSA is in the process of being replaced by the Interagency Prescribed Natural Fire Burn Plan.

C. Monitoring and reporting

Monitoring and evaluation of prescribed natural fires is the systematic process of collecting and recording data on vegetation, topography, weather, air quality, fire behavior and fire effects. Monitoring is done to ensure that the fire is staying within prescription and other parameters, and to provide data with which to adjust future prescriptions.

(1) All monitoring for PNF will be accomplished using the Fire Monitoring Handbook (FMH, located in the Fire Office or office of Chief, RM).

(2) Prescribed Natural Fires shall be monitored at minimum acceptable levels outlined in Chapter 2 ("Monitoring Schedule") of the FMH. The monitoring frequency and level (1 or 2) will be determined based on: (1) the fire's proximity to values at risk; (2) if the forecast is expected to exceed approved prescription limits; or, (3) if judged by FMO that escape from MMA (Maximum Manageable Area) is forthcoming. PNF's may be monitored from a distance (or from the air above minimum altitude for wilderness) if the information collected for the FSA can be certified as accurate by the RXB1, RXB2 and/or FMO.

(3) The Fire Management Officer assumes the Prescribed Fire Manager (RXM1) responsibilities in the case of multiple PNF's in the zone, and will assign and coordinate monitoring efforts for each.

(4) Due to the limited number of qualified prescribed fire monitors (RXFM) in the monument at any given time, the maximum allowable number of declared PNF's will be determined in part from the Resource Needs Assessment (FMO).

Prompt and accurate reporting of all monitoring data is extremely important to the program. The Biological Technician (Resources Management Section) and/or Supervisory Fire Effects Monitor will ensure that data input into the monitoring database is completed.

A PNF folder will be maintained in the Fire Office for each PNF. It will contain FSA's, maps, permits, field notes, photos, fiscal data and other documentation necessary to provide a complete record. A DI-1202 will be prepared according to established SOP found in the Suppression and MIPF sections.

D. Funding and cost accounting

See NPS-18, Section IV, Chapter 1 for complete funding guidelines governing Prescribed Natural Fires.

E. Public information actions for Prescribed Natural Fire

During PNF activities, as with Management-Ignited Prescribed Fires, the park will emphasize the positive elements of fire's past and present role in the monument ecosystem through an aggressive interpretive program.

The three actions described in Chapter XIII (Public Information and Education) of this plan will provide management guidance for this program. In addition, message-specific signs which describe a PNF in progress will be posted at appropriate trailheads and along trail(s) through or near the fire.

Post-season activities will include those tasks necessary to adequately assess how the efforts were received by the local public and cooperators. This will be accomplished through coordination meetings with neighbors, contacts with local groups, media, and the State Air Pollution Control Bureau. The purpose of this feedback is to revise plans, procedures and educational efforts regarding overall fire management at Bandelier.

IX. Air Quality/Smoke Management Guidelines

One of the key management considerations in planning and implementing a prescribed fire program is the effects on air quality and visibility, particularly from the standpoint of public perceptions. Unfortunately, today's environmentally conscious citizenry often view "clean air" as a pristine historical condition over wildlands, which needs to be returned and/or maintained. Growing evidence indicates that this condition was not the case during pre-settlement history in a fire-evolved landscape.

Burning conditions, season, and fuel characteristics basically determine levels of smoke production for any fire. Moreover, due to the unplanned nature and seasonality of wildfire occurrence, both volume and density of smoke is generally higher than that produced from management-ignited prescribed fires. It also must be understood that early wildfires in the southwest burned at the full range of intensities; and similarly that management-ignited prescribed fires can be expected to produce varying levels of both intensity and smoke.

Prescriptions for management-ignited fires have been developed based on fire and resource objectives; however, smoke production is also a primary consideration. The "hotter" end of the prescription can accomplish many such objectives and produce less smoke. For example, "greener" wood burns more slowly and combustion is more incomplete (i.e., smoldering); higher volumes of smoke and less flame is produced. Conversely, dry and well cured wood burns with higher intensity and much more flaming combustion, generally producing less smoke or particulate matter.

Management is faced with balancing the need for prescribed fires, while minimizing the impacts of smoke emissions; this balance applies to smoke produced from wildfires.

A. Smoke from combustion

The primary products of combustion of organic material include carbon dioxide, water vapor, particulate matter, carbon monoxide, hydrocarbons, nitrogen oxides and trace minerals. These are described below:

- Carbon dioxide produced is 2000 to 3500 pounds per ton of organic matter burned. It is not state regulated, but is fast becoming an important constituent in the global climate change issue.

- Water vapor produced in burning is 500 to 1500 pounds per ton of organic matter; it may have an effect on total visibility during prescribed fires.
- Particulate matter emissions range from 20 to 180 pounds per ton of total products, and are a "criteria" pollutant. They are of concern from the standpoint of public health.
- Carbon monoxide emissions produced are approximately 20 to 500 pounds per ton of total emissions. Due to relatively rapid dilution, they are not a concern to the general public. However, there is a management concern of the effects on firefighters and prescribed fire crews.
- Hydrocarbons compose 10 to 40 pounds per ton of total emissions and are not presently a criteria pollutant. Nitrogen oxides compose 1 to 9 pounds per ton of total emissions and are a criteria pollutant; however, due to low emissions they are not of concern to management at this time.

Finally, visibility is of major concern. The Environmental Protection Agency (EPA) is requiring the state to consider the impacts of prescribed fires on visibility, and thus the permit process for each proposed burn.

B. Compliance and public Information

The State of New Mexico requires a permit (NMED 8/96) for all management fires. The application asks for date(s) of fires requested, site location, type/quantity material treated, method of ignition and control, why fires are necessary and the alternatives to fires and why they are not feasible. Procedures for the entire compliance process is found in Appendix H.

Public coordination and information is critical to any successful fire management program. Before prescribed fires are conducted, the monument will notify a variety of agencies (including Los Alamos National Laboratory), media, and others via a preplanned list.

A monument brochure has been prepared and made available at the Visitor Center, Entrance Station, campground kiosks, and on-site. This brochure covers the rationale and objectives of the prescribed fire program, safety and other pertinent information which will help the public understand why the program exists. A key concept which must be conveyed to our publics is that fire, and therefore smoke, is a natural process; and that visibility may be temporarily diminished, but is representative of how things may have looked during the pre-European settlement period.

C. Smoke management strategies

The term "smoke management" can be described as a preplanned management action in which, under prescribed meteorological and fuel moisture conditions, ignition and firing patterns are utilized to keep smoke emissions within acceptable limits.

Smoke monitoring frequency for prescribed fires in grass fuel types (NFFL Models 1, 2, 3) is once every 15 minutes during active spread; for forest fuels (Models 8, 9, 10) once every two hours during active fire spread and every six hours during low fire spread. Otherwise, once per day for maximum of three days (NPS FMH). Monitoring weather at specified intervals each day requires using a belt weather kit, RAWS station, or weather station containing a hygrothermograph, fuel moisture sticks, rain gauge and anemometer. Data is required two weeks prior to planned ignition of burns over ten acres in most cases.

Thresholds for alteration of planned operations due to smoke production are outlined in the Fire Monitoring Handbook.

Strategies to be considered for each planned prescribed burn plan are:

- Reducing fuels available for combustion through removal, and using head-fire ignition (with a wind) wherever practical.
- Burn at higher large (i.e., 1000-hr TL and above) fuel moistures; a 1% increase in 1000-hr fuel moisture can result in a 3% decrease in particulate emissions. Combine this with burning at lower fine fuel moistures.
- Reduce the particulate emission factor for the fuel consumed. Employ those firing techniques which favor flaming combustion such as a backing type which, under certain conditions, can consume more mass through flaming combustion. This can vary by fuel types.
- Avoid putting smoke into smoke-sensitive areas, such as highways, the Los Alamos National Laboratory technical areas, Los Alamos townsite, and monument headquarters area during heavy visitor-use periods.
- Avoid burning when there are inversions or very stable high-pressure systems present or forecasted.
- Coordinate burns with other area agencies planning burns;

Reference is made to Appendix F, "Memorandum of Understanding, New Mexico Smoke Management" (rev 1997).

X. Fire research and monitoring

Fire is an integral process which has shaped the structure and function of most Bandelier ecosystems (Allen 1989). To properly manage fire at Bandelier requires improved scientific understanding of the interactions between the process of fire and other ecosystem components, especially vegetation. This scientific information can be developed through both research and monitoring activities.

Past fire-related research at Bandelier has focused largely upon the effects of the 1977 La Mesa Fire (cf. Foxx 1984) and upon determining prehistoric patterns of fire occurrence (Caprio et al 1989)--ongoing research activities are largely following up or elaborating on this work. A second La Mesa Fire Symposium (March, 1994) presented the results of this followup research. The 1996 Dome fire will also add to the growing body of fire effects information.

Proper resource management requires monitoring the effects of management activities to feedback information to allow "adaptive" management. Fire effects monitoring was begun in 1992 to provide this type of feedback. The monitoring protocols outlined in the NPS Fire Monitoring Handbook will be utilized.

Currently, a fire effects monitoring module is based at Bandelier and is scheduled to complete fire effects monitoring work at Bandelier, El Malpais and Lake Meredith.

XI. Public and employee safety

Public and employee safety at Bandelier is a primary management concern. The topographic relief, limited surface water, limited access routes, proximity to the Los Alamos National Laboratory technical areas, and confined developed areas combine to create hazardous situations under extreme fire behavior.

The highest risk area is the headquarters/visitor center/housing complex in Frijoles Canyon. The one entrance road for entry and exit present potential visibility problems from smoke; and hazards associated with evacuation of large numbers of vehicles. Entrapment is possible, especially between headquarters/visitor center parking and the camera overlook. Vehicles could possibly be cutoff or exposed to heat while trying to escape the canyon. Early evacuation of the public, employees and others from the canyon is indicated under conditions of extreme fire behavior below the headquarters.

Smoke is a potential hazard to visitors, both from prescribed and wildfire situations. Protection ranger staff and interpretive staff will be briefed on proper and orderly movement of visitors out of the canyon area if indicated. Fire management personnel will place appropriate warning signs along roadways where visibility is affected during prescribed fires. Ranger personnel and/or Los Alamos Police units are also available for assignment to traffic control.

Juniper and Ponderosa Campgrounds are areas to concentrate efforts in cases of threats from wildfire incidents. The Chief Ranger and Superintendent will be notified immediately of any potential need to evacuate these areas. Routes will be preselected by the appropriate overhead (generally the Incident Commander) in consultation with the Chief Ranger. The Chief Ranger will coordinate with New Mexico State Police and Los Alamos Police Department on all emergency movement of visitors and vehicles, closures of highways, and communications to ensure plan accomplishment.

Backcountry visitor safety during "high" to "extreme" fire danger is also a concern. Alerting hikers of possible impending hazardous situations is the responsibility of the Chief Ranger (with concurrent notification of the Superintendent and visitor center) on wildfire incidents. A request will be made through monument dispatch for appropriate ranger assistance to contact hikers via horse and/or foot patrols. This operation requires careful coordination to ensure that all trails, campsites, etc. are covered. If a fire threatens to cross the monument boundary, the Incident Commander will notify the neighboring agency at least 24 hours in advance of the fire's predicted crossing. Also, the designation of a qualified deputy Incident Commander from the neighboring agency will be considered at this time.

The employee housing areas are also at high risk. There are four housing areas, each with unique situations with respect to interface with the wildlands. The Wildfire Prevention Analysis (Appendix N) illustrates the degree of risk for these areas. The primary focus, for purposes of this plan, is to create defensible space for structures identified as "at risk".

The present course of action under threat of wildfire is: (1) The Incident Commander (IC) will notify the Chief Ranger and Superintendent; (2) The Chief Ranger will coordinate the orderly evacuation and followup security of housing areas, beginning with the highest priority threat; and (3) The IC will work with administrative officer to document the action with dates, times of evacuation, etc. and a photographic record developed for possible future reference.

XII. Public information and education

Adequate and accurate public information on the goals and program rationale for fire management at Bandelier is critical to program success. The local communities of Los Alamos, Española, and Santa Fe are to some degree affected by the monument programs, particularly fire management. Smoke generated from prescribed fire is of special concern, since public health and safety are affected. One vehicle for dissemination of information is through monument interpretive media. The Fire Management Officer will cooperate with the Chief of Interpretation on the following programs:

- Development of a brief interpretive handout which will discuss the basic objectives of both using Management Ignited Prescribed Fire and Prescribed Natural Fire at Bandelier.
- Develop outlines for offsite programs targeted at elementary and secondary school groups with prevention and fire ecology themes.
- Develop an outline and materials for an evening program which contains a prevention message and describes the fire program.

Public education programs on fire management themes is most effective when the smoke is present. Interpretive tours and on-site talks during prescribed fires and/or prescribed natural fires will be planned on a case by case basis. Signs will be designed and built that will convey short informative messages to the public on monument trails and roads.

XIII. Cultural Resources

See Chapter III, section E (page 12) for a description of monument cultural resources.

Bandelier contains cultural resources that are culturally affiliated with Puebloan peoples. The Zuñi and Hopi, for example, are now claiming affiliation. Under the Native American Religious Freedom Act, these peoples are afforded the opportunity to comment and provide input into many park policy and management documents.

A. Effects of fire management activities on cultural resources

Basic information on fire's effect on cultural resources is poor. However, archaeologists have examined the effects of several wildfires (Jones and Euler 1986, Lissoway and Propper 1988, Pilles 1984, Switzer 1974, Traylor, et al 1979) on federal lands. The latest of these investigations is the Dome fire of 1996 on the Santa Fe NF and Bandelier NM. A summary report on the fire effects assessment and rehabilitation efforts will be prepared.

Many of these studies have commonalities with respect to fire and cultural resources, some of which are listed below:

- Direct effects of heating, i.e., flame and/or glowing combustion. Effects vary from melting, charring, spalling, to complete incineration. Other effects, such as changing in firing profiles of ceramics, remain to be studied.
- Dozer blades and tracks can cause severe damage in and around sites by cutting deep into soils and displacing cultural materials. Handline and helispot construction, especially at night, could result in exposure of subsurface debris and may potentially affect structural sites by loading with discarded vegetation. Surface collecting by fire personnel can be an associated impact (Traylor, et al, 1979).
- Some damage to exposed walls resulting from retardant drops by air tankers and helicopters has been observed. Possible corrosive effects on cultural materials have not yet been studied.
- During mop-up, damage may result from any of the following: engines and other vehicles moving around inside the fire, moving hose, digging roots and stumps in or around a site, and snag felling operations.

- Activities associated with fire rehabilitation such as water bar construction and installation, berm leveling, equipment used for reseeding, planting, salvage logging and fuelwood collection could damage sites and materials.
- Wildfires can expose previously unknown or inaccessible cultural sites and materials to theft or vandalism.
- Prescribed fires can also damage cultural resources if burn unit preparation is done inappropriately. This would include line construction, porta-tank and hoselay setup, snagging, pre-treatment of fuels with chemicals, mechanical fuel reduction, vehicle and/or packstock movement in and around the area, mop-up and patrol operations.
- Longer term, indirect effects can include degrees of site erosion ranging from minor to extreme site alteration/cutting.

B. Management and protection strategies for cultural resources

The following checklists will be used during planning and implementing any Bandelier fire management project or activity:

1. Planning and preparation

- Use the most current site inventory information (Incident Commander, Prescribed Burn Boss, Archaeologist).
- Perform an evaluation of the resources (i.e., have the archaeologist determine what mitigation is needed: avoidance, removal of fuels, etc.).
- Identify and map cultural values at risk in consultation with the Archaeologist.
- Predict how fire may affect cultural materials in the Line Officers Briefing to the Incident Commander (FMO/Resource Advisor).
- Prepare Triple-X clearance (Burn Boss).
- Outline any Native American concerns from consultation with the monument's Native American Affairs Liaison or appropriate representative of local Pueblos (Chief, Resources Management).
- Identify and present training in cultural site identification, protection measures, etc. to fire personnel (Archaeologist).
- Train and fire-qualify monument cultural resource staff in preparation for position(s) as resource advisor (FMO).

2. Mitigating impacts on On-going Fires

- Restrict any use of dozers in the park.
- Assign one or more firefighter qualified archaeologists to mark and monitor sites and other cultural features during suppression through mop-up and rehabilitation; this position is to be assigned immediately.
- A cultural resource specialist (resource advisor) will participate in shift briefings for overhead, especially crew and felling supervisors, strike team leaders (engine & crew), and field observers.
- Plans for all operational periods should contain clear and specific written instructions regarding line construction and other suppression activities as necessary around cultural values. Appendix K contains instructions.

3. Mitigation of impacts on Prescribed Fires

- All burn plans will be reviewed by the Environmental Compliance Committee which includes the park archaeologist and Chief, Resource Management.
- The FMO will provide an annual list and detailed map of proposed burns each year by March 1.
- Survey all proposed burn units by June 1 annually (Archaeologist).
- Consider preparatory physical removal or reduction of fuels in and around cultural sites.
- Thoroughly brief all burn personnel on identification and proper protection of cultural features.
- Consider using archaeologist(s) to physically remove and document artifactual materials from a burn site; this is recommended as a last resort, and must be supervised by qualified cultural resource personnel approved by the Superintendent following appropriate consultation by the System Support Office and the State Historic Preservation Officer.

XIV. Fire Critiques

Several types of fire critiques or evaluations will be used to assess program success. One type is used for prescribed fire projects, and is intended to review and recommend corrective measures. Another is the review of a wildfire incident, consisting of types of reviews found below.

A. Hotline review for Wildfire incidents

The purpose of the "hotline" review is to examine the progress of an on-going fire incident, regardless of size. The review will provide a confirmation of the decisions being made daily in the Escaped Fire Analysis or determine where the decision process has been faulty and corrective actions are needed. The park FMO normally conducts the review with the Incident Commander and the Command and General Staff before the team is released from the incident. (See NPS-18)

B. Incident Management Team closeout

All teams assigned to in-park incidents will be subject to a closeout session, which will include generally the Superintendent, Fire Management Officer (presiding), Chief of Resources Management, resource advisors, the Incident Commander and members of the Command & General Staff and others selected at the discretion of the IC. In some cases, the System Support FMO or representative may attend. This meeting is normally held before the team is released from the incident.

C. National Review

National reviews are also possible. Sample review formats are also found in Chapter 9, NPS-18.

D. Program Reviews

Program reviews, operations evaluations, and/or FIREPRO audits are conducted periodically to ensure compliance with standards and procedures. This plan will be reviewed annually by the park FMO, with revisions included as necessary. The plan will be fully updated every three to four years.

E. Prescribed Fire Critiques

This critique will be conducted by the Prescribed Burn Boss according to guidelines and format found in Appendix H.

XV. Consultation and Plan Review

A. Consultation

The following agencies, groups and individuals were consulted during the development of this plan:

Santa Fe National Forest: Les Buchanan, Asst. Fire Staff Officer (ret.), Santa Fe National Forest; Phil Neff, Fire Management Officer, Jemez District, Jemez Springs, New Mexico; Orlando Romero, Fire Management Officer (ret.), Española Ranger District, Española, New Mexico.

New Mexico State Forestry: Frank Smith, State Fire Management Officer, Santa Fe, New Mexico.

Los Alamos County Fire Department: Deputy Chief Douglas Tucker, Los Alamos, New Mexico.

National Weather Service: Roy Pennington, Fire Weather Forecaster, Albuquerque, New Mexico.

Terrell Johnson, Consultant; Los Alamos, New Mexico.

B. Review

The following individuals are listed as Plan reviewers:

National Park Service: Cliff Chetwin, Branch of Aviation and Fire Management, Southwest System Support Office, Santa Fe, New Mexico; Charisse Sydoriak, Chief of Resources Management, Elizabeth Mozzillo, Park Archeologist; Research Ecologist, Biological Resources Division, U.S. Geological Survey, Craig Allen, Phd.; Superintendent Roy Weaver, Bandelier National Monument.

Appendices

A.	References	A. 1
B.	Definitions and Abbreviations	B. 1
C.	Organization	C. 1
	1. Organization Chart	C. 1
	2. Staffing Chart	C. 2
D.	Fire Management Thematic Maps	D. 1
	1. Vegetation Map, Bandelier National Monument & Vicinity	D. 1
	2. Fire Management Zones, Bandelier National Monument	D. 2
	3. Historic Fire Occurrence, (1931-1996), Bandelier NM	D. 3
	4. Fuel Models, Bandelier National Monument	D. 4
	5. Dome Incident Map, Bandelier National Monument	D. 5
E.	Standard Operating Procedures	E. 1
	1. SOP, Fire Administration	E. 1
	2. SOP, Readiness	E. 8
	3. SOP, Prescribed Fire	E.22
	4. Records and Reports	E.24
F.	Cooperative Agreements	F. 1
	1. Joint Powers Agreement and Operating Plan, Santa Fe Unit	F. 1
	2. Extended Attack Incident Management Team Guidelines, Santa Zone	F.29
	3. Memorandum of Understanding for Mutual Assistance in Prescribed Burning, Santa Fe National Forest and Bandelier National Monument	F.36
	4. Memorandum of Understanding for (draft), New Mexico Smoke Management Plan	F.42
	5. Initial Attack Operating Plan, Santa Fe Zone	F.70
	6. Southwest Area Preparedness Levels	F.79
G.	Environmental Assessment, Fire Management Plan	G. 1
H.	Prescribed Fire Documents	H. 1
	1. Compliance Procedures, State Air Quality Regulations for Prescribed Fires, Prescribed Natural Fires and Wildfires	H. 1
	2. FSA (Parts I & II) and PNF Decision Record	H. 2
	3. Instructions for Completing the Prescribed Fire Unit Plan	H. 3
	4. Burn Evaluation Summary, Management-Ignited Prescribed Fire	H. 4
I.	Prescriptions	I. 1
	1. Management Ignited Prescribed Fire	I. 1
	2. Prescribed Natural Fire	I. 3
J.	Research and Monitoring Plan	J. 1
K.	Line Officer's Documentation	K. 1
	1. Line Officer's Delegation of Authority and Direction to IC	K. 1

- Komarek, E. V., Sr. 1969. Fire and man in the Southwest. Proc. of the Symposium on Fire Ecology and the Control and Use of Fire in Wild Land Management. Ariz. J., Ariz. Acad. Sci.:3-22.
- Lissoway, J. D. and Propper, J., 1988. Effects of Fire on Cultural Resources. Manuscript on file, USDI, National Park Service, Bandelier NM. 9pp.
- National Park Service, 1989. Statement for Management, Bandelier National Monument, Los Alamos, NM.
- Ibid, Western Region. 1990. Western Region Fire Monitoring Handbook. USDI, National Park Service.
- Ibid, 1986. Bandelier National Monument Fire Management Plan. Bandelier National Monument, New Mexico.
- Ibid, 1996. Dome Fire Burned Area Emergency Rehabilitation (BAER) Plan. USDI, National Park Service.
- Ibid, 1996. Burned Area Emergency Rehabilitation. USDI. Draft Policy & Implementation Handbook for the Cultural Resource Site Condition Assessment & Treatment Process. 65 pp.
- Ibid, 1991. Wildland Resource Advisors Task Book. Unpublished manuscript, Yosemite National Park, Resource Management Office. 5 pp.
- Ibid, 1990. Wildland Fire Management Guideline, NPS-18. U.S. Govt Printing Office, Wash, D.C.
- Ibid, 1995. Resource Management Plan; Bandelier National Monument. Unpublished Plan on File at Bandelier National Monument, Los Alamos, NM. 436 pp.
- Pilles, P. J. 1984. The effects of forest fires on archaeological sites. Paper presented at 49th Annual meeting of the Society for American Archaeology. Portland, Oregon. 15 pp.
- Presidential Proclamation no. 1322. 1916. The White House, Washington, D. C.
- Swetnam, 1990. Fire history and climate, pp. 6-17 in: J.S. Krammes (tech. coord.), Effects of Fire Management on Southwestern Natural Resources. USDA For. Serv. Gen. Tech. Rep. RM-191.

B. Definitions and Abbreviations

Aggressive Attack: usually follows fire discovery immediately and with sufficient force to effect control at the earliest possible time with minimum acres burned.

Appropriate Suppression Response: suppression response that most efficiently meets fire management direction under current and expected burning condition with the minimum use of people and equipment.

Confine: to restrict a fire within boundaries that are either predetermined (pre-attack planning) or determined during the fire.

Contain: to surround a fire with a fireline, or firelines if spot fires exist, for the purpose of checking the fire's spread.

Control: to put a fire out by fireline construction, burning out, cooling hot spots, and other actions that remove any threat of subsequent fire escape.

Escaped fire: wildfires that cannot be successfully controlled by initial attack forces and prescribed fires that escape prescription and burn as wildfires.

Escaped fire situation analysis: an analysis of alternative suppression strategies for either confining, containing or controlling a wildfire.

Fire dependent or fire maintained ecosystems: an ecosystem can be called fire dependent or fire maintained if periodic perturbations by fire are essential to the functioning of the system.

Fire evaluations: the process of examining and appraising fire monitoring information.

Fire monitoring: the systematic process of collecting and recording fire-related data, particularly with regards to fuels, topography, weather, fire behavior, fire effects, smoke, and fire location.

Fire prescription: a written statement defining the objectives to be attained, and the conditions of temperature, humidity, wind direction and speed, and fuel moisture, under which a fire will be allowed to burn.

Fire Situation Analysis (FSA): a document that the National Park Service utilizes to identify and select the most viable decision alternative in regards to a natural fire

- Swetnam, T. W., and Betancourt, J. L. 1990. El Nino- southern oscillation (ENSO) phenomena and forest fires in the southwestern United States. In proceedings of the 6th Annual Pacific Climate (PACKUN) Workshop, 5-8 March 1989, Asilomar, California Tech-Rep. No. 23.
- Switzer, R. R. 1974. The effects of forest fire on archaeological sites in Mesa Verde National Park, Colorado. *The Artifact*. 12(3): 1-8.
- Traylor, D. and L. Hubbell, N. Wood, B. Feidler. 1978. The La Mesa Fire study: investigations of fire and fire suppression impact of cultural resources in Bandelier National Monument (unpublished NPS report).
- USDA, Forest Service and USDI. 1995. Federal Wildland Fire Management Policy & Program Review. Final Report. 45 pp.
- Weaver, H. 1951. Fire as an ecological factor in the southwestern pine forests. *J. Forestry* 49:93-98.
- White, C. S., 1990. The Interaction of Prescribed Fire, Monoterpenes, and Soil N-cycling Processes in a Stand of Ponderosa Pine (*Pinus ponderosa*). Presented at Fire and Environment: Ecological and Cultural Perspectives Symposium March 20-24, 1990. Knoxville, TN. 6 pp.

BAND: Bandelier National Monument
BI: Burning Index
BLM: Bureau of Land Management
CPSU: Cooperative Park Service Resources Studies Unit
DI: Department of the Interior form
EFSA: Escaped Fire Situation Analysis
ERC: Energy Release Component
FIREPRO: Fire Programming
FMO: Fire Management Officer
FMP: Fire Management Plan
FTE: Full Time Equivalency
IC: Incident Commander
LAL: Lightning Activity Level
NFDRS: National Fire Danger Rating System
NFFL: National Forest Fire Laboratory
NIFC: National Interagency Fire Center
NPS: National Park Service
RXB1: Prescribed Burn Boss I
PNF: Prescribed Natural Fire
PWE: Primary Work Element
SACS: Shared Applications Computer System
SWR: Desert Southwest System Support Office, National Park Service
RXFM: Prescribed Fire Monitor
TLFM: Time Lag Fuel Moisture
WIMS: Weather Information Management System

(PNF) in consideration of environmental, economic, political, social, and other factors. (Note: proposal to change to "Interagency PNF Burnplan" under review).

Natural: in accordance with and determined by nature; a primitive state of existence undefiled by civilization.

Natural fire: any fire of natural origin, i.e., caused by lightning or volcanic activity. In a broader context, the role fire played in the evolution of an ecosystem. This means fire has influenced natural selection, ecosystem structure, and distribution of plant and animal populations.

Prescribed fire: skillful application of fire to natural fuels under conditions of weather, fuel moisture, etc., that will allow confinement of a fire to a predetermined area and at the same time will produce the intensity of heat and rate of spread required to accomplish certain planned benefits to one or more objectives of silviculture, wildlife management, hazard reduction, etc. Its objective is to employ fire scientifically to realize maximum net benefits at minimum damage and acceptable cost.

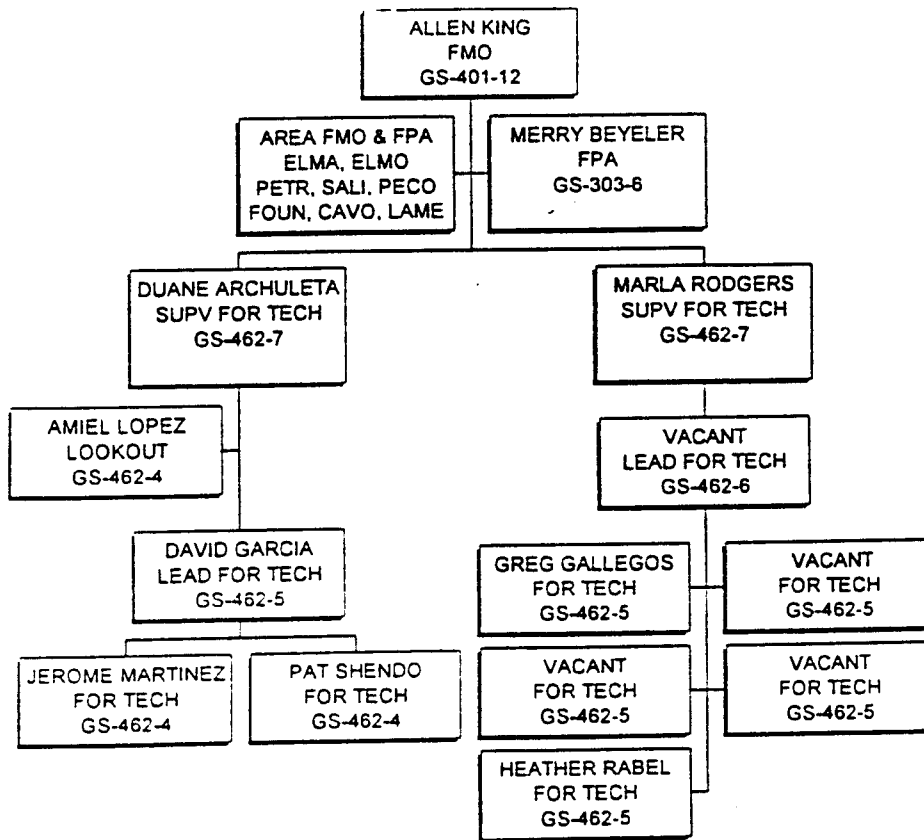
Prescribed natural fire: fire of natural origin, i.e., caused by lightning or volcanic activity, which is allowed to burn under prescribed conditions.

Wildland fire management: all activities related to the prevention, control or use of fire burning through vegetation under specific prescriptions for the purpose of achieving fire management objectives.

C. Organization

1. Organization Chart

BRANCH OF FIRE MANAGEMENT
1997



D. Fire Management Thematic Maps

1. Vegetation Map, Bandelier National Monument & Vicinity

See the following page.

2. Fire Management Zones, Bandelier National Monument

3. Historic Fire Occurrence, (1931-1996), Bandelier NM

4. Fuel Models, Bandelier National Monument

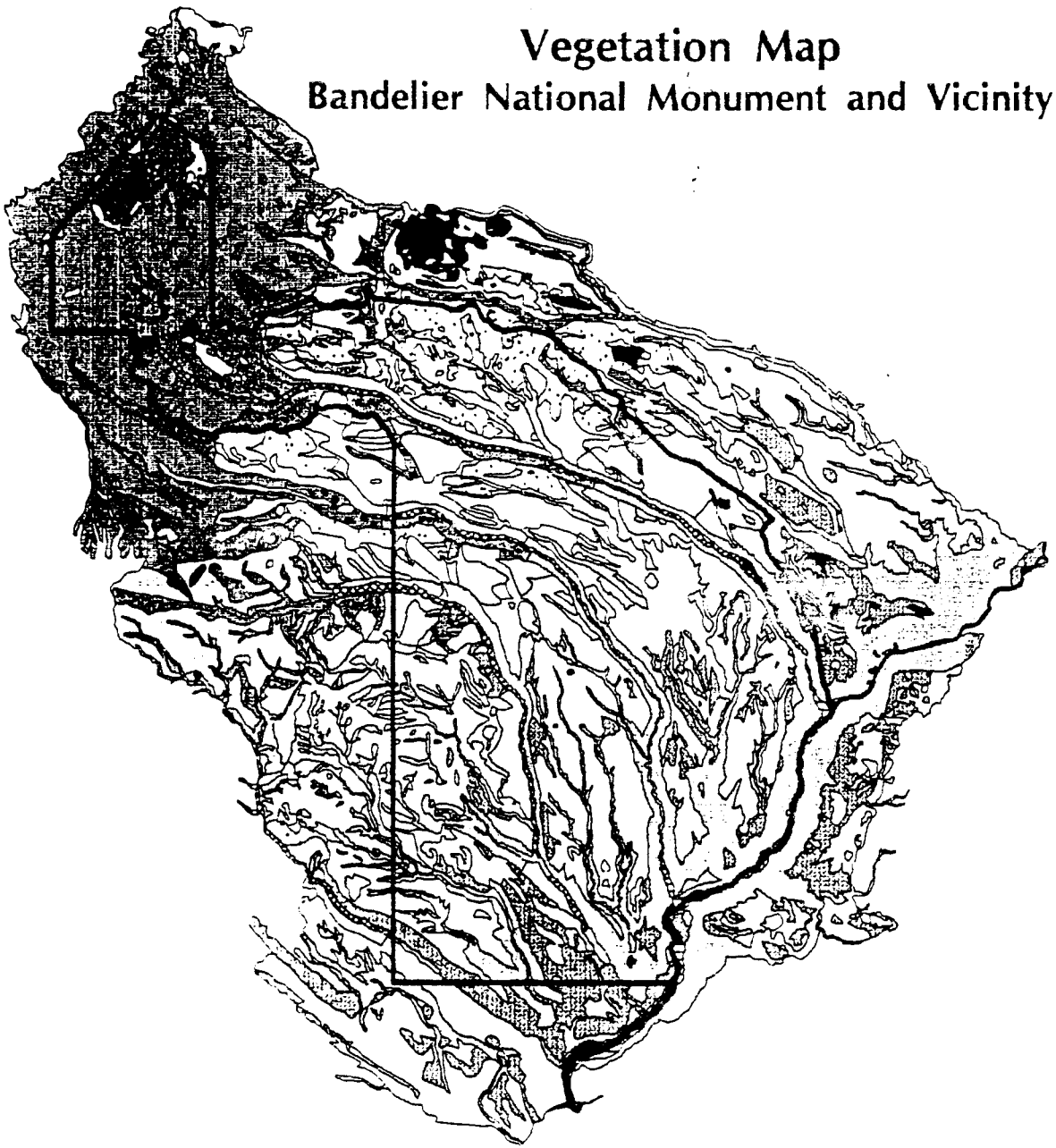
5. Dome Incident Map, Bandelier National Monument

2. Staffing Chart











<u>ERC</u>	<u>STAFF CLASS</u>	<u>ACTION</u>
0-9	I	FMO reviews Interagency Agreements; staff is in training and planning for readiness. Management-ignited prescribed fire occurring normally. Engine 91 is fire ready. Permanent personnel step-tested and fire ready for initial attack.
10-20	II	Fire Cache inventory complete. Initial Attack equipment is fire ready. Engine Foreman should be aware of all resources available for Initial Attack. Prepare fire roads and helispot for operational use. Implementation Daily Roster of red-carded personnel.
21-38	III	Continue daily staffing reports on Engine 91 (and/or E-92) to Santa Fe Zone Dispatch. FMO (or acting) on duty in park during burning period, and "on call" status other times. Superintendent briefed on fire conditions at high end of ERC. All sections notified of fire conditions throughout the Park.
39-44	IV	Includes all actions for Class III. Engine crew is within a 15 minute hike from the engine. Fire Management personnel may be called to work extended hours at the discretion of the FMO. Aerial recon requested if lightning activity has occurred the same or previous day. Engine Foreman will be aware of Santa Fe Zone Pre-Planned Dispatch actions. FMO recommends any restrictions and/or closures to Superintendent.
45+	V	Includes all actions listed above. Selected fire certified personnel on ordered standby during lightning activity as requested by FMO. All ordered standby personnel are to be assigned to Headquarters cache and/or an engine and properly outfitted with PPE. FMO to brief Superintendent daily on fire situation locally and nationwide. All planned MIPF ignitions will be delayed. FMO takes appropriate action on new or ongoing PNF's according to PNF decision chart and Fire Situation Analysis.

Vegetation Map

Bandelier National Monument and Vicinity

















FOREST AND WOODLAND COVER TYPES

-  Aspen
-  Mixed Conifer
-  Ponderosa Pine - Mixed Conifer
-  Ponderosa Pine
-  Ponderosa Pine - Pinon-Juniper
-  Pinon-Juniper Woodland
-  Juniper Woodland
-  Riparian Forest
-  White Rock Canyon Spring/Seep Woodland
-  Orchard

POLITICAL BOUNDARIES

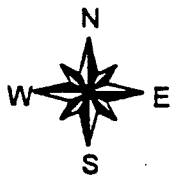
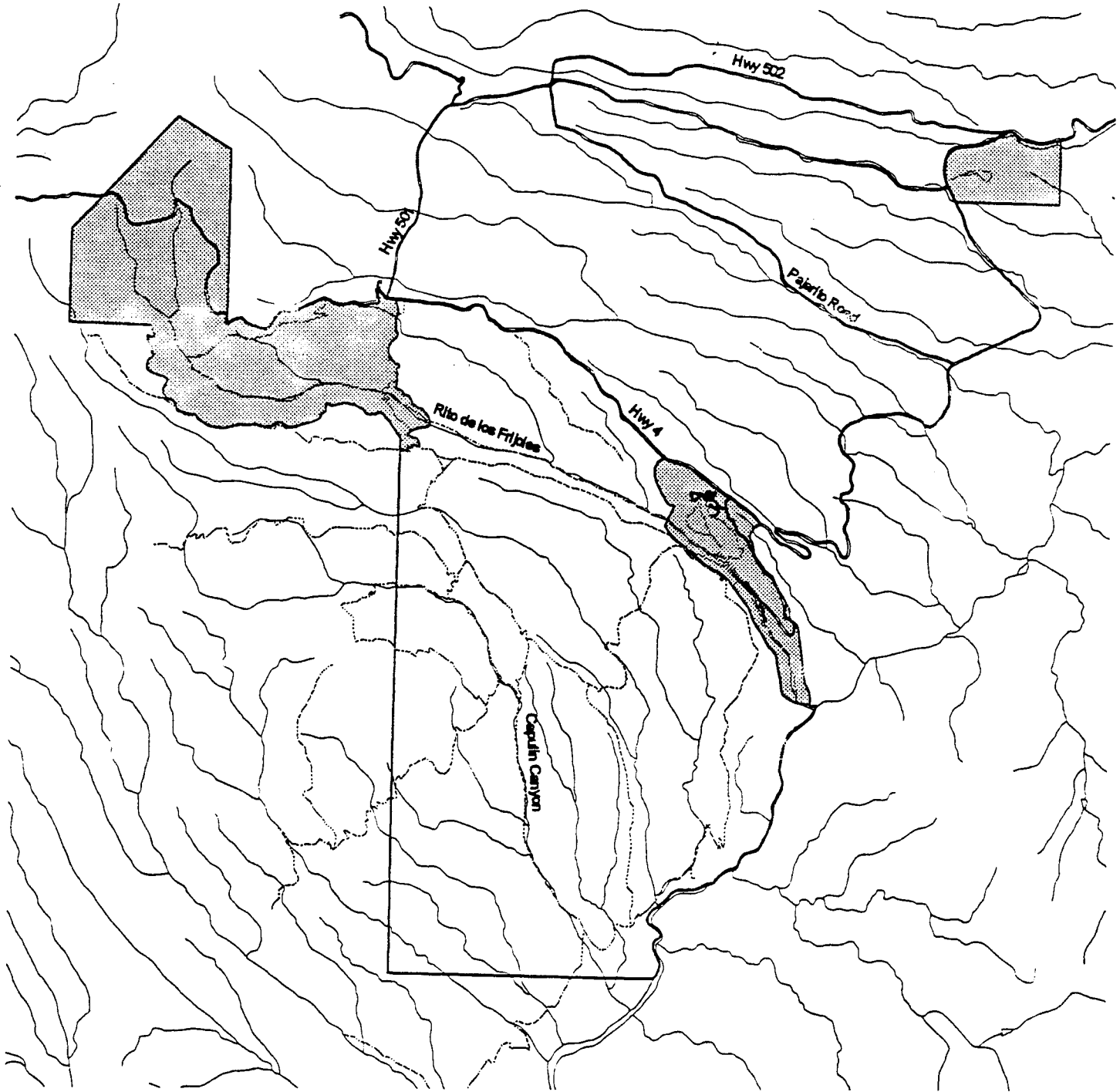
-  Monument Boundary






NON-FOREST COVER TYPES

-  Felsenmeer/Talus
-  Canyon Wall Complex (variable, mostly non-forested cover types on cliffs)
-  Bare Rock Cliffs or Quarry
-  Meadow (depressions and other moist sites)
-  Montane Grassland (slopes of caldera rim peaks only)
-  Grassland (all other grasslands)
-  Grass-Shrub (a mixture of grassland and shrubland)
-  Juniper Savanna (5-8% juniper cover)
-  Shrubland
-  Pond
-  Previously Drowned by Cochiti Reservoir
-  Stream (Rio Grande)
-  Sand
-  Human Developed Areas

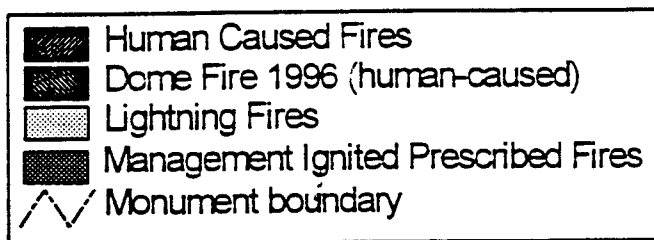
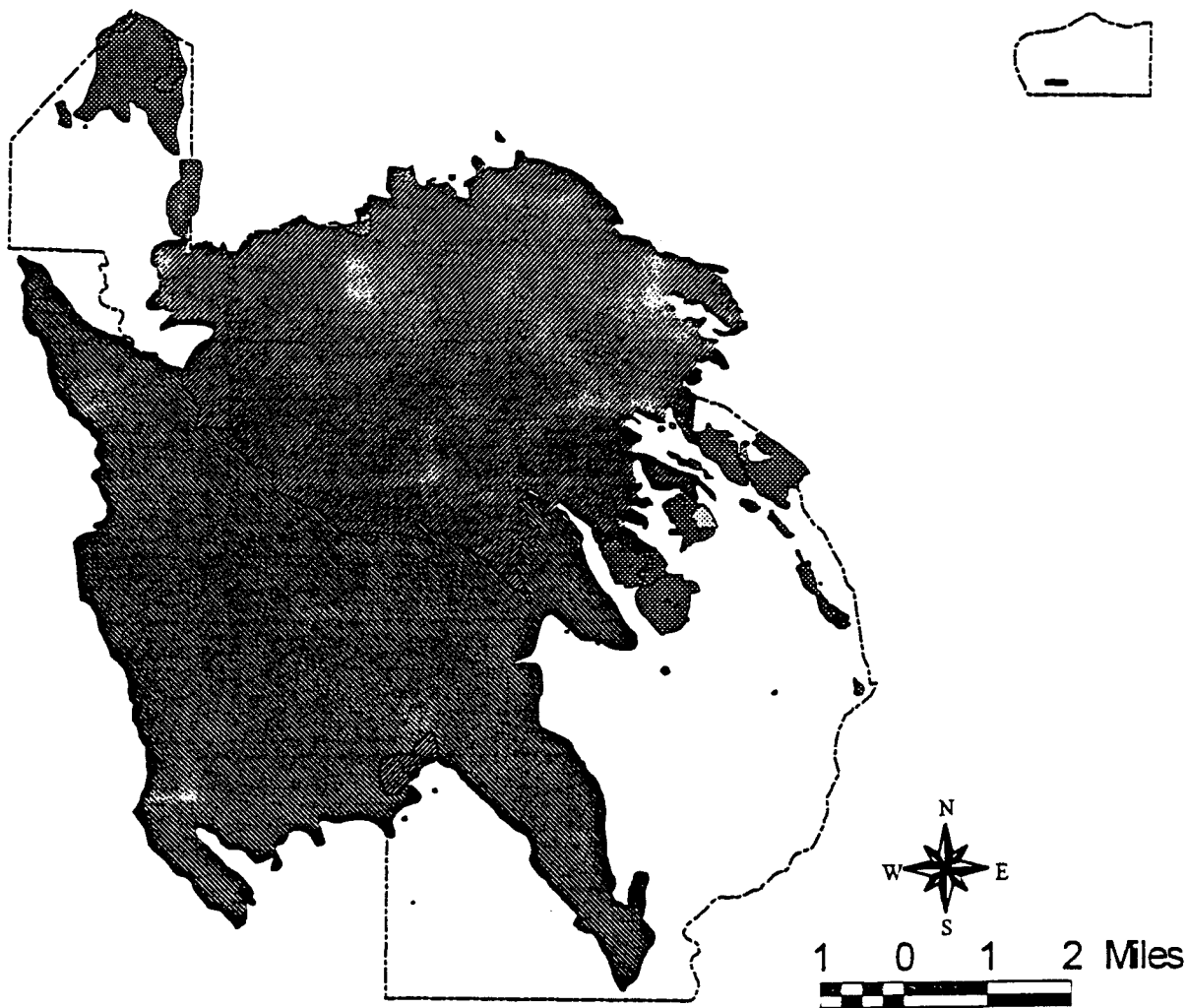
Scale 1:145,000

Bandelier National Monument Fire Management Zones



-  Full Suppression Zone
-  Prescribed Natural Fire Zone
-  Trail
-  Hydrology
-  Paved road

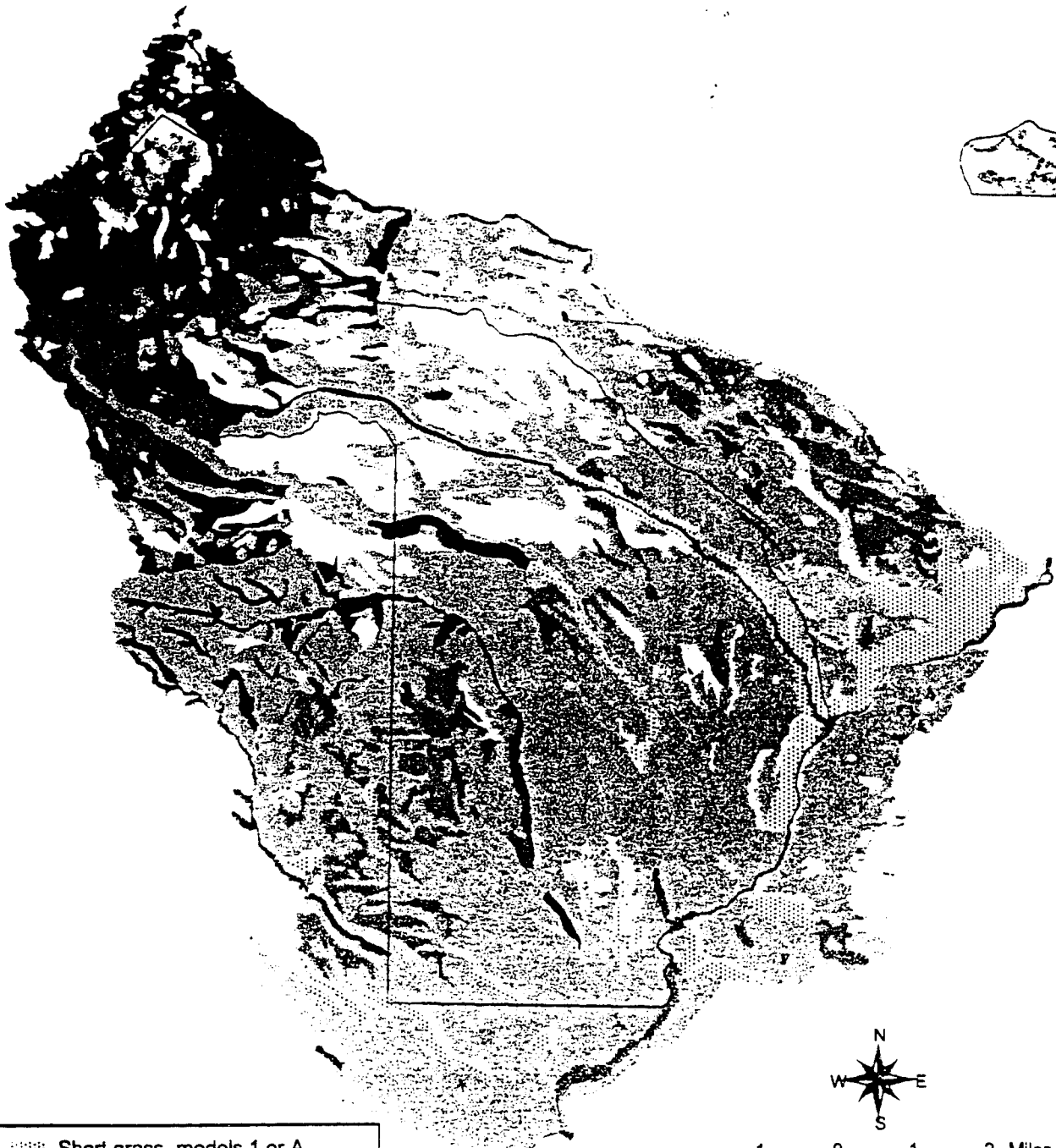
Historic Fire Occurrence 1931-1996* Bandelier National Monument



* Records are missing for 1961, 1963-71.

Fuel Models*

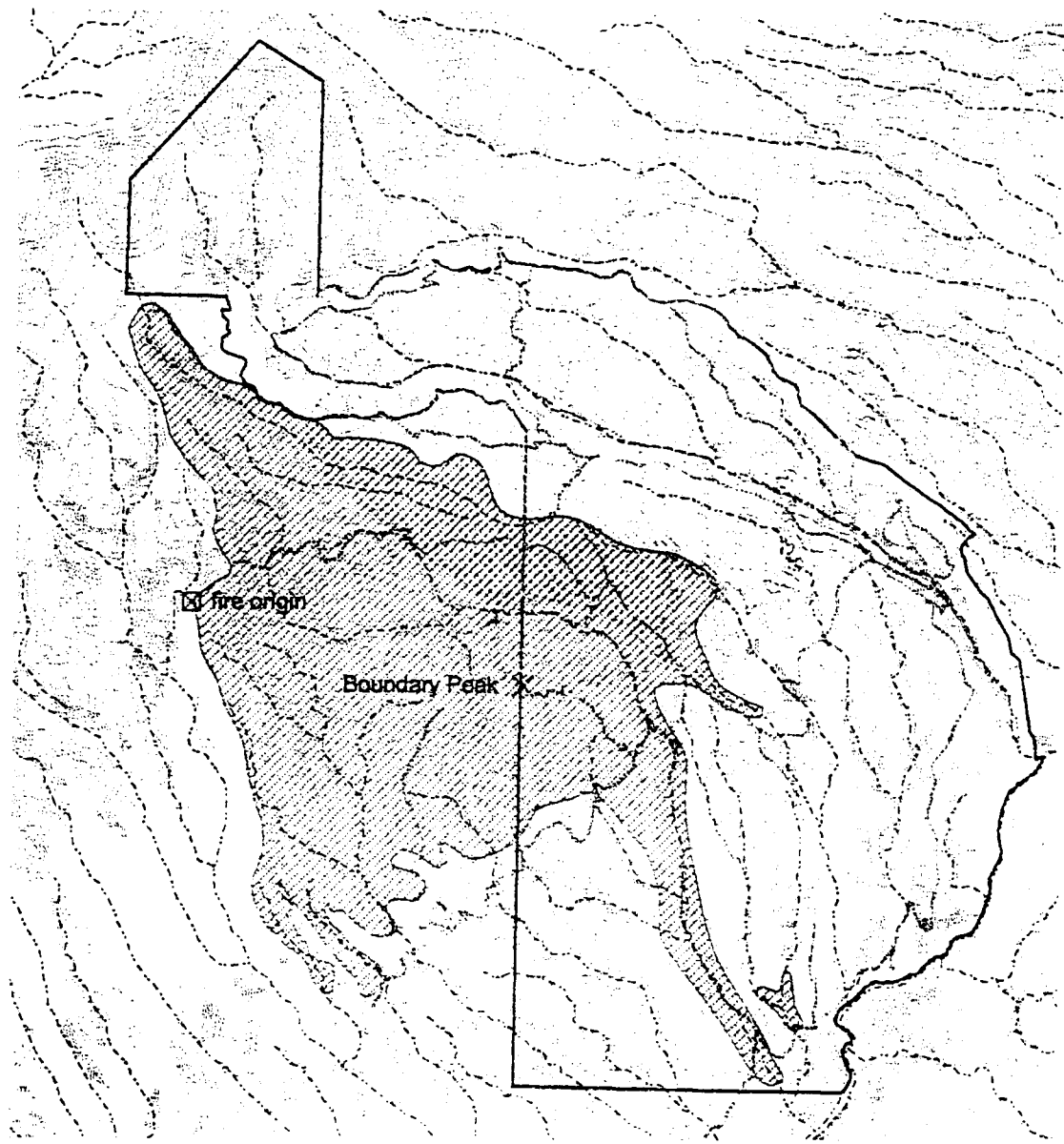
Bandelier National Monument



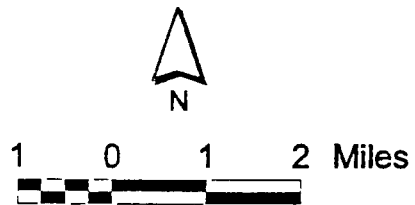
- Short grass, models 1 or A
- Grass understory, models 2 or C
- Tall grass, models 3 or L
- Brush, models 4 or B
- Brush, models 5 or F
- Short needles, models 8 or G
- Long needles, models 9 or C
- Heavier fuels, models 10 or U
- Water
- Bare ground or developed area
- Bandelier boundary

* Reflects pre-1996 Dome Fire conditions.
 Fire behavior (NFFL) = models 1-10.
 Nat'l Fire Danger Rating System = models A-U.

Dome Fire 1996 Bandelier National Monument Santa Fe National Forest



- X Boundary Peak
- ☒ fire origin
- △ Hydrology
- △ Trails
- ▨ Dome Fire area 1996 (16,561 ac)
- ▩ La Mesa Fire area 1977 (14,269 ac)
- Bandelier boundary
- 100 ft contour interval



E. Standard Operating Procedures

1. SOP, Fire Administration

a. When the call comes

When the call comes for you to be dispatched to a fire (not initial attack) you'll need to write down several things:

- (1) Your resource order number. You may be asked for your total flight weight (Your weight plus no more than 65 pounds of gear).
- (2) **Fire name, location and directions** on how to get there (if you are expected to drive a rental car there from the airport). the **job** you'll be doing, and **when** they want you to be there and **VERY IMPORTANT, THE PHONE NUMBER OF THE DISPATCH OFFICE AT THE FIRE.**
- (3) Give this information to your supervisor and clear the assignment with him/her.
- (4) Let the Fire Program Assistant, AFMO, FMO, Engine Foreman, or the head dispatcher know about your assignment including: fire name, location, job, etc. They will open a project fire account for you (this is where your overtime, hazard pay comes from and any overtime for the person who is filling in for you while you are gone).
- (5) Now it's time to go get your red pack, change into your nomex, etc., bring your current red card with you and have it handy, in case they reassign you to another fire or job. Incident experience will be documented on the back of the card and signed off by the supervisor you worked for while on the fire. At the end of the season, this information is input into the fire computer (to keep everyone's records as current as possible).
- (6) Another member of the crew or park staff will most likely drop you off at Santa Fe Zone dispatch, BLM building (or it could be the Mob Center in Albuquerque, too). Zone dispatch in Santa Fe will most likely take care of the travel arrangements from there to the fire. This could be a regularly scheduled flight in Albuquerque or a charter from Santa Fe or Albuquerque. Sometimes they ask you to make your own travel arrangements, if so, have the Fire Program Assistant call SATO travel at 1-800 359-7286. If the assistant is gone, a person that regularly does travel can help. They will need the **project fire account number, your blanket travel authorization number, where you**

are going, are you going to be picked up or will you need a rental car ?, etc.

- (7) Once you are at fire camp, if you can, give the park a call and let them know where you really are. Frequently you end up not where you originally thought you were going. These type of calls are official business and can be reimbursed on your travel voucher when you get back. If time permits, check out one of the monument's telephone calling cards from the Contracting Officer.

b. Fire time sheets

- (1) If you are on a crew, keep your own time on a crew time report (yellow and white notebook). Your crew boss will keep your official time, but it's a good idea to have something to compare it with just in case there is a discrepancy.
- (2) If you are overhead, you will probably have to keep your own time on a crew time report and have the fire time recorders make out your fire time sheets (red dogs or pink sheets).
- (3) Before you sign the fire time sheets (usually just before you come home or get reassigned), make sure your name is correctly spelled, your social security number is correct, and all the dates and times agree with your records. Now is the time to catch mistakes, not when you go home and try to remember what happened two weeks ago after a series of 18 hour days.
- (4) If you have purchased anything in the commissary, there will be deductions in the lower right hand side of the fire time sheet.
- (5) Check the lower left side for appropriate hazard pay entitlements.
- (6) Keep this with you until you return home. Your regular timekeeper will total up all the overtime, hazard pay, etc. and double check it with you before it goes into payroll. If the option exists for faxing in your time, **DO IT!!**. This could very well eliminate the need for major corrections on your time sheets and your overtime may get paid in the proper pay period's check instead of two or three months later (extreme case). But you **still** have to bring in the original pink sheet when you return.

c. What you are entitled to while on an extended fire assignment

- (1) Most out-of-state assignments are 21 day maximum assignments. The only exceptions are Alaska and Hawaii, 30 days so far. This does not mean that you will always be gone that long, but it is a possibility. There is a work to rest ratio of 2:1, i.e., 2 hours of work for every hour of rest.
- (2) While in transit, if you are expected to take care of your own lodging and meals, you are entitled to \$50 per day for lodging and \$30 for food (lower 48 states). You will need receipts for you **LODGING ONLY**. While you are in camp, meals and lodging are provided (even if that's only MREs and a paper sleeping bag), so you are only entitled to incidental expenses of \$2 per day. Bring all receipts back with you and include them in your travel voucher.
- (3) Keep a notebook of travel times, what you rode in (gov or pov, bus, etc.), where you went if you went to more than one fire (you'll need to have fire management office open another account for you on the second fire, so call while you're near a phone). These details are hard to reconstruct two weeks later and you might lose out if you don't have any documentation for the travel voucher.

d. What to take in your red/yellow pack

- (1) **RED PACK:** 2 sets of nomex pants and shirts, take the unmarked ones (no Bandelier turkeys), as you'll be exchanging them in camp for clean ones. **MAXIMUM WEIGHT: 45 POUNDS**
- (2) Personal items: toothbrush, paste, soap, shampoo, chapstick, heavy duty hand lotion, towel, cold medicines, sunscreen, any prescription medicines (at least a three week supply), extra pair prescription eyeglasses, enough socks, t-shirts, and underwear for at least two weeks. Also a hooded sweatshirt, jacket, or wool sweater, longjohns or sweats might be needed if you are going in the fall to Northern California, the pacific northwest or the rockies. Throw in a pair of well worn sneakers and rubber thongs (for the shower), also a pair of sunglasses with side protectors and a leash (aka glacier glasses). **WOMEN:** Don't forget sanitary supplies.
- (3) **YELLOW/BLUE PACK:** Hard hat, goggles, gloves, 8" high, leather boots with vibram sole without steel toes. Fire shelter, small first aid kit, water bottles (4 quarts minimum). brush jacket (optional), headlamp with extra batteries. snack, ample supply of bandannas and ear plugs. **MAXIMUM WEIGHT: 20 POUNDS**

- (4) Leave camera, walkmans, etc. are discouraged. If you must, take one of those throw away camera.
- (5) Gear weight limit is $45 + 20 = 65$ pounds. Label your pack with your name and total weight (you and your gear), your agency, and park. Everything must fit inside the pack, any attachments (sleeping bags or pads) could easily get lost.
- (6) Travel clothes: Firefighters, go in your nomex. Overhead: nomex is recommended, uniform is ok. If a non-uniform personnel: street clothes.

Travel Authorization procedures

We currently have Travel Manager for Windows (5.0g) installed in the C-drive on the fire program assistant's (Hewlett Packard), FMO and PFSM computers (both toshibas).

1. Get a TA number from Budget Assistant.
2. Using mouse, single click on **start**, then on **programs**, then on **travel manager**, then on **travel manager plus**. This will bring up the program to the opening credits.
3. Click on the **OK** button at bottom of credit screen.
5. When the Menu bar appears, double click on the **FILE**. Another box will appear, click on **NEW**. This will let you start from scratch for a new document, click on **AUTHORIZATION, VOUCHER, VOUCHER FROM AUTHORIZATION OR LOCAL VOUCHER**.
6. Type in the SSN for the traveler. This will load the traveler's name and personal information into the document. If the traveler is not already in the TM system, you will have to complete the personal information screen. Your answers will help determine what you are entitled to on your travel advance (via ATM). Generally if you indicate that you have a credit card, you will get 100% of you M&IE. It assumes everything else will go on your credit card.
7. Click on **Authorizing Official** button, type in: Ray Kremer, and Chief, Admin Services. After you have finished this box, click on the **OK** button, to save the information and then you will get back to the main document.
8. Click on **Authorization number** button. 7120-FY-#, (1) above.
9. Click on the **itinerary** button. it asks for a brief itinerary of your trip. The authorization will calculate the estimated amount for the travel authorization. Use the mouse and click on the various fields and type in requested data.
10. Add in the **Purpose** for the trip, fire uses: **Wildfire suppression, Prescribed burning and PNFs**. In the **TYPE** field, **LOA** is what fire uses for the blanket travel authorizations. This type of authorization can be used as many times as needed through out the season until the end of the fiscal year.
11. Add in **Begin and End travel date, travel starting and ending location is Bandelier Nat'l Mont. 99% of the time.**

12. Click on **Add** to enter duty location. Click on the **+ sign**, an alphabetical listing of states and foreign countries will appear. Click on the down arrow until you find the state where you are headed. Then click on the **city name** of the duty location. Click **OK** to close the screen and **OK** to accept **Itinerary**.
13. Click on **Add Ticket Information**. Type in the **amount**. Make sure the dates are correct and click on **OK**. If the Forest Service or anyone else paid for the airplane ticket, **ignore this step**.
14. Click on the **Expenses** button. Click on the **down arrow** for choices, double click to select. This is where rental cars, atm fees, phone calls, etc. are included.
15. Click on the **Accounting** button. Double click on the desired number in the master accounting numbers list. Click on **NEW** if needed and type in the account numbers. 7127 in the top box, FY#?? (4 DIGITS) in middle and 249 in the third (this type of account is for suppression actions. (see the accounting opening forms log for the appropriate account numbers).
16. Click on the **Comments** button. The **preset** comments are already in the computer, double click here to get them to "stick".
17. Now that we use our American Express cards for a travel advance, you can skip the section on advances. These ATM advances are **not** listed in this section. They will be dealt with on the travel voucher when you get back from the trip. We have to pay 2.75% (the govt) for this service (to American Express) and you will need to claim it on your voucher for reimbursement. Also some ATMs will charge a fee right when you take the money. This is ok, just remember to put it with your travel voucher.
18. Click on the **file, save**. Use the travel authorization number as the name.
19. Click on **print preview**. You will get a picture of the authorization to check. If all is ok, click on **print**. The print setup has already been defined and the forms selected.
20. When the print box appears, go ahead and click on the **OK** button.
21. Exit the program by clicking on the **file, exit**. You have **already saved** the document so you can say **no** when it asks if you want to save it again. Double click on the **X** in the upper right hand corner to exit Travel Manager.

Travel Vouchers

1. Travel Manager plus will prepare a **travel voucher from the TA that you previously prepared**. Click on **file, voucher from authorization**. If you get an odd message about the software, you will need to construct the voucher from scratch.
2. Click on the **SSN box**. Double click on the person you want.
3. Click on the **itinerary** button, typing in the details of your trip (flight times, meals provided, etc.). Effective in 1997, we don't have to write down the **time** when we left and returned. Now it is standard to get 3/4 of a day's per diem for the first and last day.
4. **Airline ticket number**, just type in "see attached", as you will be attaching a receipt from the airlines, that looks very similar to the real tickets.
5. **Lodging costs** go in this box, you can put in the first night's lodging and use the duplicate key to finished the rest of the boxes.
6. **Expenses** button, put in rental cars, phone calls home, etc. Click on the down arrow for any other expenses.
6. **Accounting number** that was indicated on the TA. For wildfire travel voucher, you will probably have to add the account number you used for your overtime. If so, follow instructions in TA section of this SOP.
7. **Comments**, explain anything unusual here, like lunches provided or lodging on a purchase order from a forest service office. This helps speed up the process.
8. Click on **file, save, preview, or print**.

If you need any more help, the user's guide to Travel Manager is kept in the grey cabinet under the laser printer, inside the TM box. It has examples of documents if you need them.

2. SOP, Readiness

a. Engine Foreman (EF) Standard Operating Procedures

- (1) Minimum qualifications:
 - (a) Incident Commander, Single Resource
 - (b) Chainsaw Operator/Faller to 24" dbh
 - (c) Engine and Pumper operator
 - (d) FFT1
 - (e) Engine Foreman experience for the engine type used at Bandelier NM (Type 6, 7)
- (2) Course work:
 - (a) S-130, S-190 Basic Firefighting and Introduction to Fire Behavior
 - (b) S-211 Water and Pumps
 - (c) S-212 Wildfire Power Saws
 - (d) I-200 Incident Command System
 - (e) S-200 Incident Commander, Single Resource
 - (f) S-216 Driving for the Fire Service, S-216
 - (g) S-201 Supervision or equivalent

Note: A Taskbook for ENGB must be completed for this position.

(3) Daily work assignments

The Engine foreman will be responsible for the following aspects of the daily fire operation:

- (a) Have the daily project work planned in advance of the shift.

- (b) At 0900 daily, call into the Santa Fe Zone Dispatch (438-7800) the following information: Foreman on duty, number on crew, location of crew during the shift.
- (c) At 0915: Crew begins physical training (PT);
AEROBIC 30-40 min daily, i.e., practical job related exercises such as hiking, running, field exercises with packs.

UPPER BODY STRENGTH: 15 min of pushups, pull-ups, weights, chopping wood.

Daily PT will be subject to change if the project work involves aerobic exercise that itself is greater than the daily PT. (e.g., Cerro Grande). Daily PT will also be altered during suppression season as needed or at the discretion of the Engine Foreman.

- (d) Daily Engine Checklist: the Engine Foreman will ensure that the Asst. Engine Foreman (EF) performs this function as part of the Asst. EF's responsibility. Checklist will be kept in a binder on the foreman's desk. All items on the checklist must be accomplished and signed off by the Asst. EF.
- (e) Engine Foreman will write up supply orders as needed. The crew will notify the Foreman of any needed supplies for the maintenance of the operation.
- (f) All suggestions for improvement of the operation should be brought to the attention of the Engine Foreman for discussion.
- (g) In-service training will be held monthly as a minimum. Each crew member will present a topic relevant to the operation on a rotating basis.
- (h) Engine Foreman will report daily to the AFMO (Supervisory Forestry Technician), location of crew for each project, and any other relevant information.
- (i) All personnel driving Engine 91 or Engine 92 for any reason must be approved in advance by the Foreman.
- (j) All employees will possess a valid state driver's license.

(k) Safety: The Engine Foreman will ensure that safety requirements are met for crew members during project work or other fire related assignments. OSHA and Bandelier NM Safety regulations will be used as guidelines on establishing safety habits during fire assignments and project work.

- i) SAFETY IS THE # 1 PRIORITY (WITHOUT EXCEPTION) FOR FIRE MANAGEMENT OPERATIONS.
- ii) Project work forms will have a Safety and Hazard Analysis Form attached, outlining potential hazards during that specific project work assignment. Crew members will read the analysis and attend a safety tailgate session prior to beginning the job. The monthly safety form will be turned into the safety officer at the end of the listed month by the Engine Foreman. A copy will go to the FMO as well. Persons whom exhibit safe work practices will be nominated for a Safety Award by the Engine Foreman.
- iii) The Engine Foreman will ensure that the working crew receives two 15 minute breaks per shift, and one 30 minute lunch break. Depending on the assignment and weather conditions, the Foreman can authorize further breaks as needed.
- iv) The Foreman will observe each crew member during the daily work shift to detect signs of fatigue or stress and will respond accordingly to minimize possible injury. Any crew health problems should be brought to the attention of the Engine Foreman.
- v) Engine Foreman will document any injuries occurring on project work or fire assignments.

This includes completing the following forms: CA-1, CA-16. The foreman will also obtain witness statements from crew personnel present at the time. Engine Foreman will immediately notify the FMO following any injuries requiring medical attention.

(l) The following forms will be required for each work assignment:

- i) project work form
- ii) Safety and Hazard Analysis form

iii) Triple Y Clearance

iv) map of project site

All foremen or project work leaders must have read these forms to be aware of the expectations and restraints for each project.

(m) FIRE CACHE: The Engine Foreman will ensure the following guidelines are adhered to:

- i) Fire Cache will be kept neat and orderly. Work schedules and for each pay period will be posted. The FMO's location will be posted for each shift.
- ii) Issuing cache equipment to individuals will require a receipt for property form (DI-105) be completed, with a copy kept at the cache, and a copy in the individuals' fire folder in the Fire Program Assistant's file cabinet.
- iii) Daily projects will be listed on the bulletin board, with an extended project list. All assignments listed for each are to be carried out by the foreman or asst. foreman. No deviations except emergencies or fire calls.
- v) A cache inventory will be done twice a year, in the spring and the fall.
- vi) All cache fire tools and equipment will be in a state of READINESS at all times. After each fire call, replacement tools and equipment will be taken from the existing stock in the cache and incoming tools will be made fire ready and added to the cache stock.
- vii) Any safety violations noted in the cache will be brought to the attention of the foreman immediately.
- viii) Engine Foreman will ensure that the lead faller is responsible for the overall maintenance of all fire management chainsaws. The lead faller will qualify and instruct the crew as required by the foreman. While on project work, the lead faller will help make sure that the power saws are being used in the safest manner and by qualified personnel.

(6) Engine Foreman responsibilities as IC Type 4:

Upon receiving a smoke report, the foreman is responsible for the following:

- (a) Notify the monument AFMO/FMO.
- (b) Notify Santa Fe Zone Dispatch of correct legal description: T, R, and S.
- (c) Know the current Pre-Planned Dispatch level and appropriate response.
- (d) Observe fire behavior from tower if visible.
- (e) Ensure that Engine 91 is response ready.
- (f) Maintain contact with SF Zone Dispatch for legal description changes, fire behavior changes, and resources at scene.
- (g) Engine 91 will be dispatched in a safe manner, following all the speed and road regulations. No abuse of light bar or siren will be tolerated.

(7) Foreman as IC at the fire scene:

- (a) Size up the fire, report this information to SF Zone Dispatch and whether you can handle the incident with current resources. Initiate strategy and tactics, determining which type of suppression action will be taken.
- (b) Once you are committed as the IC, the fire is **your responsibility**. Do not leave the fire scene until you have completed the suppression action. Remain in radio contact with SF Zone Dispatch during the course of the fire, notify the monument of fire status as well. If the "suppression action" is a confinement as dictated by a pre-attack EFSA, the IC may need to be relieved if this is an extended time involvement, i.e., 2-3 days.
- (c) IC is responsible for determining the contain or control status of fire. IC will determine when the fire is declared out, notifying SF Zone Dispatch and the monument AFMO.
- (d) If the fire requires additional resources, all orders will go through SF Zone Dispatch, **no exceptions**.

- (e) If the fire is beyond your experience level, notify SF Zone Dispatch and request a more experienced IC. The initial attack IC can, following consultation with AFMO and/or FMO, place a resource order for the Type III team. Then the IC/FMO/Superintendent needs to prepare a briefing for incoming team.
 - (f) Engine Foreman will maintain a Crew Time Report for each incident, and have the Fire IC sign or will sign him/herself for the correct times.
 - (g) In the absence of the Fire Program Assistant, the Engine Foreman will prepare Fire Time Sheets for the crew and themselves. Otherwise, Crew Time Reports will be turned into the Fire Program Assistant for processing.
 - (h) Upon arrival back at the park, the IC or foreman will complete a fire report DI-1202 on the SACS computer. All fires, no exceptions.
 - (i) Foreman will make sure that SF Zone Dispatch has been notified of Engine 91 return to Bandelier and the availability of Engine 91 for fire response.
 - (j) Foreman will ensure that all vehicle mileage logs have been correctly filled out for each incident, and that the engine is fire ready before allowing the crew to go off duty.
- (8) Fire tower supervision
- (a) Foreman is responsible for supervising all fire tower operations. This duty will require training of all personnel on weather fire behavior, use of the WIMS computer system, equipment at the weather station, calling in a smoke report to SF Zone with required information, use of Osborne Fire Finder, other related activities. (See Fire Lookout SOP)
 - (b) Foreman will maintain the RAWS unit to ensure it's operation and function. Weather data will be utilized for suppression and prescribed fire operations.
 - (c) In absence of the Fire Program Assistant, foreman will maintain files as necessary for fire operations. This includes opening up project fire accounts, with budget funding advice forms, as needed.
 - (d) Foreman will submit all DI-1 order forms to AFMO for approval.

- (e) Foreman will ensure that all training is documented for each crew member with one copy to Personnel, one copy to their fire folder, and the original to the individual.
 - (f) Foreman will ensure that on his or her lieu days, work schedules are current, and that project work assignments are laid out for those days the Foreman is gone. Foreman will ensure that the AEF does not deviate from designated project work, except during fire activities.
 - (g) Foreman will explain sick and personal leave procedures and responsibilities to each crew member.
 - (h) Foreman will not permit any crew member whom is incapable of working that day to be assigned to any work project. That person will be sent home subject to evaluation if the case warrants. FMO will be notified.
 - (i) Foreman will make every attempt to resolve any intra-crew conflicts, and will take the necessary steps to notify the proper personnel if conflict requires additional resolution at higher levels.
 - (j) Foreman will notify the AFMO of any reports of discrimination or conflict within the fire management operations.
 - (k) Foreman will notify the AFMO of any crew member whom is not performing job duties adequately. Foreman will document these incidents or problems.
- (9) Foreman responsibilities on presuppression details (including out of monument severity details)
- (a) Complete a budget funding advice form in advance of the detail.
 - (b) Know the fire account numbers for these activities.
 - (c) Have a copy of their and the crew's Blanket Travel Authorization with you.
 - (d) Keep a log of all activities while on details, accurate work times, lieu days and any other information relevant to the detail.
 - (e) **KEEP ACCURATE MILEAGE LOG FOR THE DETAIL, KEEP A SEPARATE MILEAGE LOG FOR ANY SUPPRESSION FIRES THAT YOU RESPOND TO.**

- (f) Carry extra fire reports, fire time sheets, crew time reports and plain notebooks.
- (g) Know the Park FAX Number: (505) 672-9607, fax the fire time sheets to the Fire Program Assistant. If this is not possible, bring them home with you. But keep in mind, the sooner the time gets to the timekeeper, the sooner you get paid!
- (h) Charge all mileage to the proper detail or fire account.
- (i) Order supplies as needed to replenish engine stock from the proper detail or fire account.
- (j) Respect the strike team leader's authority and carryout all assignments to best of your ability.
- (k) KEEP ALL HOTEL RECEIPTS. YOU WILL NEED THEM TO CLAIM LODGING ON YOUR TRAVEL VOUCHER.
- (l) Document all training completed for each crew member on the detail.
- (m) Call park, at 505-672-3861 x 552, 551, or 550 to inform them of any changes in tour of duty, location, fire assignments, or problems. Talk with the monument FMO on these issues, or with the Fire Program Assistant in FMO'S absence.

(10) Other foreman responsibilities

- (a) Maintain a yearly Fire Suppression Atlas in cache, listing all suppression and prescribed fire activities.
- (b) Update yearly all operational manuals.
- (c) Maintain good communications with the FMO and with other monument sections.
- (d) Thoroughly learn all fire management operations and how they fit into Resource Management's and other sections' operations.

b. Assistant Engine Foreman (AEF) Standard Operating Procedures

- (1) Minimum qualifications
 - (a) Foreman qualified, Type 7 engine.

- (b) ICT4
- (c) Faller qualified, minimum DBH 24"
- (d) Squad Boss: 2 years, Firefighter, 2 training assignments handcrew
- (e) Engine and Pump Operator

(2) Course work

- (a) S-130, S-190
- (b) S-211, S-212
- (c) S-200 ICSR
- (d) I-220 ICS

The above course work is considered the minimum for the position, the needs of Bandelier Fire Management Division may require further training for the position. Also, a Taskbook for ENGB should be initiated.

(3) Designation as Assistant Engine Foreman

- (a) Minimum 2 years experience as a Firefighter, type 2. Training and qualifications tested on actual fire assignments.
- (b) Thorough knowledge of Bandelier Fire Management operations.
- (c) Ability to supervise daily project work, and fire line assignments.
- (d) Ability to follow direction of Foreman and implement project goals for each season.

(4) Daily operations

- (a) AEF will report to cache at the beginning of each shift and prepare crew for physical training (PT). After PT, AEF will read fire board for that day's project work assignment. AEF and the crew will start working on the daily engine checklist, prepare tools and supplies for the day's work, review the project objectives, safety hazards and ecological restraints for that day's project.

- (h) AEF must be able to accurately fill out in a timely manner:
 - i) Crew time reports
 - ii) Fire time sheets
 - iii) DI-1202, fire reports
 - iv) CA-1, accident forms
 - v) An updated daily log and vehicle mileage sheet.
- (i) Inform FMO or AFMO of crew location before each shift.
- (j) Informs SF Zone Dispatch when Engine 91 is out of service.
- (k) Knowledge of fire management units, vegetation types, fuel loads, NFFL Fuel Models. Use of compass and topographical maps, forest maps, fire road system.

(6) Other AEF responsibilities

- (a) Fire assignment as IC.
- (b) As Foreman with Engine 91 on other agency lands during fire call.
- (c) As Foreman on presuppression details.

SEE ENGINE FOREMAN SOP RESPONSIBILITIES FOR THESE SUBJECTS.

The Assistant Engine Foreman is accountable directly to the Engine Foreman on all matters. Exhibit good conduct and set example for crew members at all times. Be prepared for each shift mentally and physically.

c. **Bandelier Fire Tower Standard Operating Procedures**

Fire tower lookout personnel, whether they are the seasonal lookout, or they are hired on for a single shift will adhere to the following SOP. The lookout position is under the direct supervision of the Engine Foreman. The lookout will use "Bandelier Fire Tower" to return radio calls. The phone number is 672-3688.

- (b) On foreman's lieu day(s), AEF will assume the role of Engine Foreman. Will inform the FMO on the location of that day's project work, supervise the lookout operations and take the fire weather observations as needed.
 - (c) Call SF Zone Dispatch (438-7800), inform them of # on crew, foreman's name and the location of Engine 91 during the shift. Also, other overhead available for out of area dispatch.
 - (d) On foreman's days off, AEF will be aware of existing weather conditions, staffing levels, closures or restrictions in the monument or Santa Fe National Forest, lightning storms from previous evening, pre-planned dispatch level if in effect, current fires, resources from Bandelier on fire assignments, and resources in the zone that will be available for initial attack.
- (5) Primary AEF responsibilities:
- (a) Ensure that Engine 91 is fire ready.
 - (b) Hand tools for IA and project work are sharpened. Inadequate tools are culled out.
 - (c) Chainsaws are fire ready, each with a well-equipped saw kit.
 - (d) Submit a list of needed supplies to foreman.
 - (e) All hose is washed, tested and stored.
 - (f) Cache is neat and clean at end of shift.
 - (g) When supervising projects, they are carried out in a safe manner and all project guidelines and objectives being implemented.

FMO or the Engine Foreman. **#1 priority calls:** observed lightning and/or incoming thunderstorms or cumulus cloud buildup over monument or forest lands, to the FMO or Engine Foreman.

- (i) Smoke observations should be reported by the lookout, (1) location (use T,R,S), (2) volume, color, and any observed behavior (i.e., columns). The lookout may be asked by the Foreman to give a visual landmark near the site of the smoke. In addition, the foreman may request the lookout notify SF Zone Dispatch and/or the monument FMO, if the Foreman is in a poor location (for radio use). In this situation the lookout will act as a relay for the Engine Foreman.
- (j) During an observed lightning strike, it is important that the lookout maintain communication with SF Zone Dispatch/FMO. Continue to observe the reported smoke in the event of any behavior changes or if a multiple lightning strike has occurred. If this situation occurs, the same procedure will be in effect with the second or third smoke. Make sure that all your legal descriptions are accurate and they have been logged separately on an Incident Action Sheet. Accurate times of each strike should be noted. All communications with SF Zone Dispatch should be logged in the notebook. When you make phone calls to SF Zone Dispatch during a fire emergency, **write down the names of the dispatchers and exactly what you talked about.** This could be critical information for the fire report or investigation if fire was person-caused. Do not leave the tower during a smoke report or an engine response.
- (k) If Engine 91 responds to a smoke report in our initial attack (IA) Zone or to a support action, normal communications will be through Santa Fe Zone Dispatch. We do not go through the Bandelier Fire Tower for communications or for filling resource orders. If the Fire Tower is not needed for information or communications on a specific incident, you will refrain from using the fire frequency unless you have a smoke report. If you do observe a smoke, go through the above mentioned procedures.
- (l) The tower can also request a cross Azimuth reading on observed smokes from Dome Lookout (USFS), or Cerro Pelado Lookout. Their call names are the lookout **name** itself. Channel 5 is the Forest Net frequency to contact the lookouts or Santa Fe Zone Dispatch.
- (m) During the shift you will constantly scan the monument and surrounding lands for smokes. Make sure that you take your time and do a full 360 degree scan. Rest your eyes periodically, as you could

(1) Daily operation

- (a) Entrance to the tower requires opening of the gate. The combination is 1-0-8-1. The tower living quarters are directly below the tower and is usually occupied by a seasonal fire crew member. Since crew responses to fires can vary, be quiet and courteous, as this individual may be sleeping when you enter the tower.
- (b) Call park dispatch (701) on the radio, "Bandelier Fire Tower is on duty, date and time" (in 24 hour time).
- (c) Call Santa Fe Zone Dispatch at 438-7800 and the Fire Management Office. Inform them that the lookout is staffed. Get the staffing class for that burn period, status of Engine 91, and any smoke reports or sightings from the previous evenings.
- (d) In your call in to Santa Fe Zone Dispatch, find out if the Santa Fe Forest is in any level of Pre-Planned Dispatch, and if they are currently responding to any smoke reports and their location. This is very important, as it determines where Engine 91 will be for the rest of the burning period.
- (e) After the call in to the above places/people, begin your log in the book provided to record the events of your shift. Be accurate and precise with your data during your shift. The Engine Foreman will check the log weekly.
- (f) Equipment for the shift will include: 10 X 50 binoculars, spotting scope, monument and forest maps, various quad maps, compass rose map, Osborne Fire-finder, Interagency Incident Action Form, weather observation sheet, list of phone numbers for monument personnel, list of phone numbers of U.S. Forest Service fire personnel of the various districts of the SNF and their call numbers.
- (g) Training in the use of all tower equipment and proper radio procedures will be carried out by the Engine Foreman. This will be prior to any individual being allowed to work a shift alone in the tower. The Engine Foreman will certify that the lookout personnel are skilled and competent in the use of the Osborne Fire-finder, topographical maps, fire behavior on observed smokes, and legal descriptions of located fires.
- (h) Throughout the shift the lookout will stay alert and report any existing and/or expected weather conditions/changes during the shift to the

3. SOP, Prescribed Fire

a. Prescribed Fire Standard Operating Procedures

- (1) Develop specific fire management objectives (FMQ, Ecologist, Chief Resource Management) according to Resource Management Plan.
- (2) Identify, locate, mark and map the proposed burn unit (Burn Boss, Resource Management Staff) in the field; (place early request for PFSC Module(s).
- (3) Install monitoring plots (Fire Effects Monitor Supervisor).
- (4) Visit the burn unit (Burn Boss, Supv. Forestry Technician); identify mitigation required, locate weather/fuel monitoring site(s), hazards. Prepare and route YYY and unit map for XXX clearances (Burn Boss).
- (5) Prepare burn unit (line construction, mitigation, hazard elimination, etc.) (Supv. Forestry Technician & crew.)
- (6) Pre-burn data collection: Spot forecast (burn day -2), on-site weather observations and fuel sticks readings (Fire staff).
- (7) Prepare and submit proposed burn plan by March 1 to Fire Management Committee, BAND (Burn Boss).
- (8) Receive signed burn plan & attachments, including state permits.
- (9) Schedule resources for burn day (Burn Boss/Program Assistant); All other agency prescribed burn personnel will be certified for to the the position assigned based on Prescribed Fire Qualifications.
- (10) Notify other agencies and park neighbors burn day -1, using the prepared list (Program Assistant).
- (11) Prepare and present Briefing (burn day, Burn Boss).
- (12) Conduct burn according to plan.
- (13) Mop-up and patrol as needed (Supv. Forestry Technician/crew).
- (14) Follow-up data collection: fuels, photos, etc. (Monitor Supervisor).
- (15) Post-burn critique as needed (Burn Boss); include evaluation of mitigation. Complete postburn report and attach.

work an extended shift. If you come on shift the morning after a lightning storm, find out from the Foreman what path the storm followed or the location of observed lightning and watch these areas carefully during the shift.

Many smokes do not show themselves until the heat of the day, particularly if the storm was accompanied by rain. Be patient, many lightning strikes are on single snags that only put up a thin wisp of smoke. Also be aware of WATER DOGS, which are low hanging moisture frequently seen after a storm. Also forest service roads that have logging traffic will tend to kick up dust for a brief moment that could be mistaken for smoke. Study what you see. In the tower is a sheet of paper that lists the Azimuths of Tschiti Dump and lab areas that will put up smoke. These are not fires. It is important to note that if you are not sure or in doubt about a smoke sighting, report it in to the Engine Foreman and to Santa Fe Dispatch. The report will be checked out.

- (n) Visitor contacts can be frequent during the summer months at the tower. Tower personnel will be courteous and informative about the monument to the visitors. During a fire emergency, inform the visitors of the situation and the need for no interruptions. Knowledge of the park's flora, fauna, topography, history, geology, backcountry, and trail system is very helpful, there are several books in the monument's library to increase your knowledge. Any problems with tower operations will be reported to the Engine Foreman, FMO or the Fire Program Assistant as soon as possible. If you cannot report for a shift, please notify the Fire Management office before your shift so we can make other arrangements.
- (o) At the end of your shift, take down the flag, call 701 on the radio to tell them you are out of service, also inform Santa Fe Dispatch you are out of service. Lock tower door, put up closed sign as you leave. Unless requested not to, lock the gate on your way out.

NOTE: SF Zone Dispatch may request you stay on duty for an extended shift. If this happens notify the Foreman or FMO.

4. Records and Reports

Record/Report	Revision/ Preparation Frequency	Responsibility	Distribute
Cache Inventory	semi-annual (Pre + Post Season)	Engine Foreman	BAND
Delegation of Authority & Fire Complexity Analysis	as needed	Superintendent	BAND
DI-1202	all fires	FMO	BAND/SACS
EFSA	as needed	Designated Monument staff, Superintendent, FMO	BAND
Fire Atlas	as needed	FMO	BAND
Fire Danger	daily (season)	Program Assistant	BAND/WIMS
Fire Personnel Roster	as needed (season)	Program Assistant	BAND
Fire Prevention Analysis	every 3 years	FMO	BAND/SSO/ NPS-NIFC
Fire Situation	daily (season)	Program Assistant	BAND/SF Zone/ NPS-NIFC
Fire Situation Analysis (FSA)	daily (during PNF)	Prescribed Burn Boss	BAND BAND/WIMS
Fire Weather	daily (season)	Program Assistant/ Engine 91 or 92	
FIREPRO Submission	annual	FMO	SSO/NPS-NIFC
FMP Review	annual	FMO	BAND/SSO/ NPS-NIFC
FMP Revision	3 years	FMO	BAND/SSO
Red Cards	annual-January	Program Assistant	Affected fire personnel

- (16) Reports: narratives, DI-1202, edit photos, review monitoring data.
- (17) Complete final package and file by Fire Management Unit, number, name, with file cross-referenced with master basemap of burn units (Burn Boss/FMO); letters of appreciation to assisting agencies (Burn Boss and Program Assistant).

F. Cooperative Agreements

- 1. Joint Powers Agreement and Operating Plan, Santa Fe Unit**
- 2. Extended Attack Incident Management Team Guidelines, Santa Fe Zone**
- 3. Memorandum of Understanding for Mutual Assistance in Prescribed Burning, Santa Fe National Forest and Bandelier National Monument**
- 4. Memorandum of Understanding for (draft), New Mexico Smoke Management Plan**
- 5. Initial Attack Operating Plan, Santa Fe Zone**
- 6. Southwest Area Preparedness Levels**

See the following pages for these sections.

Record/Report	Revision/ Preparation Frequency	Responsibility	Distribute
Training & Experience Records	annual	Program Assistant	BAND
Training Needs Assessment	annual	FMO	BAND/SSO
Prescribed Fire Records/Burn Plans	as needed	FMO/Forestry Tech/Program Assistant	BAND

1. Joint Powers Agreement and Operating Plan, Santa Fe Unit

See the following pages.

**JOINT POWERS AGREEMENT
AMONG THE
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
AND THE UNITED STATES
FEDERAL AGENCIES OF THE DEPARTMENTS
OF
AGRICULTURE AND OF THE INTERIOR
WITH
WILDFIRE PROTECTION RESPONSIBILITIES**

This Agreement is made pursuant to the Joint Powers Agreement Act, Sections 11-1-1 et. seq., NMSA 1978, between the Energy, Minerals and Natural Resources Department - Forestry Division ("EMNRD") and agencies of the United States Departments of Agriculture and Interior with wildfire protection responsibilities. This Agreement supersedes and replaces that certain cooperative agreement among the same agencies dated May 15, 1978. This Agreement does not modify nor affect any existing agreements for fire suppression among federal agencies.

WHEREAS, EMNRD is responsible for planning and coordinating wildfire suppression activities on non-federal and non-municipal lands in New Mexico at Sections 68-2-6, 68-2-8 and 68-2-24; and

WHEREAS, the U.S. Department of Agriculture, Forest Service is responsible for wildfire suppression activities on federal lands in New Mexico at Section 5, Act of April 24, 1950 (16 USC 572), the Act of June 30, 1914 (16 USC 498), Reciprocal Fire Protection Act of 1955 (42 USC 1856), Economy Act of June 30, 1932 (31 USC 1535), the Act of December 12, 1975 (16 USC 565a-1-3) and the Annual Department of the Interior and Related Agencies Appropriations Acts; and

WHEREAS, it is in the parties' mutual interest to form a single coordinated effort to provide Cooperative Wildfire Suppression Services on federal, state and private lands in New Mexico.

NOW THEREFORE, the parties agree, as follows:

1. For the purpose of this Agreement, the following definitions shall apply:

- a. "Area Coordination Zone" means designated locations within New Mexico which have been established for coordination of activities of local fire suppression agencies, which exist or may be created in the future as needed, i.e., Southwest Zone at Silver City, Southeast Zone at Alamogordo, Central Zone at Albuquerque, Northcentral Zone at Santa Fe and North Zone at Taos.
- b. "Cooperative Federal Agency" means any agency of the United States Departments of Agriculture or Interior which has fire protection responsibilities on federally owned land and which is a party to this agreement for fire protection on State and private lands.
- c. "Cooperative Wildfire Suppression Services" means reimbursable expenses performed by a cooperating agency on lands of another cooperating agency after the responsible agency has been notified of an escaped fire.
- d. "Cooperative State Agency" means an agency of the State of New Mexico working under the authority of a Joint Powers Agreement with EMNRD for wildfire suppression.
- e. "EMNRD's State Forester" means the individual who serves as Director of EMNRD's Forestry and Resources Conservation Division or the State Forester's designated representative or someone appointed to act in the capacity of State Forester.

WHEREAS, the U.S. Department of the Interior, Bureau of Indian Affairs, Bureau of Land Management, National Park Service and Fish and Wildlife Service is responsible for wildfire suppression activities on federal lands in New Mexico at:

- a. Protection Act of September 20, 1922 (42 Stat. 857; 16 U.S.C. 594),
- b. Economy Act of June 30, 1932 (47 Stat. 417 as amended; 31 U.S.C. 1535),
- c. Taylor Grazing Act of June 28, 1934 (48 Stat. 1269; 43 U.S.C. 315),
- d. National Park Service Acts as amended (67 Stat. 495; 16 U.S.C. 1b),
- e. Federal Property and Administrative Services Act of 1949 (40 U.S.C. 471),
- f. Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66; 42 U.S.C. 1856a),
- g. National Wildlife Refuge System Administration Act of 1966 as amended (80 Stat. 927; 16 U.S.C. 668dd thru 668ee),
- h. Disaster Relief Act of May 22, 1974 (88 Stat. 143; 42 U.S.C. 51210),
- i. Federal Land Policy and Management Act of 1976 (90 Stat. 2743),
- j. Federal Grant and Cooperative Agreement Act (96 Stat. 1003; 31 U.S.C. 6301 thru 6308), and
- k. Supplemental Appropriation Act of September 10, 1982 (96 Stat. 837), and
- l. Authority applicable to all federal agencies - Reciprocal Fire Protection Act of 1955 (42 USC 1856), and the Economy Act of June 30, 1932 (31 USC 1535).

WHEREAS, all parties listed above are public agencies as that term is defined in Section 11-1-2 NMSA 1978; and

suppression action. Requested actions beyond initial efforts are Cooperative Wildfire Suppression Services. Requested suppression action beyond the declaration of an escape shall be reimbursed. Efforts shall be made to make prompt notification to the Responsible Agency of all initial attack responses.

3. COOPERATIVE WILDFIRE SUPPRESSION SERVICES

When Cooperative Wildfire Suppression Services are furnished by any party to this Agreement on lands for which EMNRD or a Cooperative Federal Agency has wildfire protection responsibility, the Responsible Agency shall assume financial responsibility for the wildfire when notified by the cooperating party that the wildfire has escaped initial attack. The responsible party may assume control and make specific requests for services. If that is done only the services so requested are Cooperative Wildfire Suppression Services. Cooperative Wildfire Suppression Services are reimbursable from the time the wildfire was declared to have escaped until suppression support is no longer requested of the Cooperating Agency. Cooperative Federal Agencies shall not bill one another for cooperative wildfire protection services furnished among Cooperative Federal Agencies.

Cost reimbursement shall be handled by direct billing between EMNRD, including billing on behalf of other state agencies and Cooperative Federal Agencies. The National Guard shall be reimbursed by invoice through EMNRD's State Forester to the responsible agency when mobilized under a Governor's Declared Emergency.

Subject to the exclusion of billing between Cooperative Federal Agencies, eligible reimbursement shall include:

- a. Salaries and expenses of employees. The Responsible Agency shall reimburse the agency furnishing assistance by paying reasonably incurred direct salary costs (including regular pay, overtime and hazardous duty pay, if applicable) for personnel including seasonal employees. No billing for non-response personnel shall be accepted

assignment to initial attack, reinforcement and extended suppression of wildfires.

- w. "Response Personnel" means only those personnel directly engaged in wildfire suppression activities; administrative personnel shall not be included.
- x. "Responsible Agency" means the federal or state agency that has the responsibility for fire protection on the lands upon which the wildfire is burning.
- y. "Southwest Area Coordination Center" means the location where coordination between Area Coordination Zone's, Cooperative Federal Agencies, Cooperative State Agencies and other national Area Coordination Center's is monitored, coordinated, etc. The Southwest Area Coordination Center is located in Albuquerque, New Mexico.
- z. "Unified Command" means a method for Cooperative Federal or State Agencies or individuals who have jurisdictional responsibility, and in some cases those who have functional responsibility on a wildfire incident, to contribute to:
 - 1). Determining overall objectives for the incident.
 - 2). Selection of a strategy to achieve the objectives.

2. RECIPROCAL FIRE PROTECTION SERVICES

Wildfire suppression in the designated Initial Attack Zones within the State of New Mexico as specified in formal Joint Powers Operating Plans that are set forth in paragraph 10.e., below, of this Agreement are Reciprocal Fire Protection Services.

When Reciprocal Fire Protection Services are furnished by any party to this Agreement on lands for which another has fire protection responsibility, the party having responsibility must take over the fire when notified that the fire has escaped initial attack or must request that the initial attack party continue

- o. "Initial Attack Zones" means agreed upon areas assigned to each party as its responsibility for Initial Attack efforts.
- p. "Itemized Statement of Costs" means documentary verification by the Fiscal Authority of every claim for payment, including a cost statement which is broken down by specific labor and material categories for the purpose of cost reimbursement.
- q. "National Guard" means any element, vehicle or personnel of the New Mexico National Guard assigned to support any wildfire suppression effort authorized by this Joint Powers Agreement and as a Cooperative State Agency.
- r. "National Wildland Fire Qualifications System" means the qualification system that is followed by the National Association of State Foresters, National Wildfire Coordination Group and the Departments of Agriculture and of the Interior for establishing the training and experience standards necessary for a person to be able to work in specialized positions on wildfire suppression activities.
- s. "Reciprocal Fire Protection Services" means the non-reimbursable fire protection assistance extended as Initial Attack efforts in response to a fire on the lands under another agency's responsibility.
- t. "Reimbursable Expenses" means labor and material costs for fire suppression services by a Cooperative Federal or State Agency that are furnished as a Cooperative Fire Protection Service.
- u. "Reinforcements" means all forces deployed after the initial attack forces to assist the initial attack agency in the suppression of the wildfire.
- v. "Resources" means all personnel, material and equipment available, or potentially available, for

- f. "Escaped Fire" means a wildfire that exceeds the suppression capabilities of the initial attack effort.
- g. "Fire Protection Services" means fire suppression, support and facilitating services as supplied by any party hereto or by EMNRD's Cooperative State Agencies.
- h. "Fiscal Authority" means a person designated to authorize and certify expenditures.
- i. "Governor's Declared Emergency" means the official declaration by the Governor of New Mexico when wildfire suppression needs require resources of the State beyond those appropriated to EMNRD. The Governor is authorized by Section 6-7-1 NMSA 1978 to appropriate up to \$500,000 for each declared emergency.
- j. "Hazardous Material" means substances and materials in quantities and forms that the U.S. Secretary of Transportation has found to be an unreasonable risk to health, safety or property when transported in commerce.
- k. "Incident" means a wildfire occurrence which requires suppression action by trained wildfire suppression personnel to prevent or minimize loss of life or damage to property and natural resources.
- l. "Incident Commander" means the individual responsible for the management of a wildfire incident.
- m. "Initial Attack" means the total efforts undertaken by the responding agency to either suppress, or attempt to suppress a fire up to the point in time where such effort is determined to be ineffective and the fire is declared an escaped fire. Reimbursable work begins when the responsible agency is notified of the escaped fire.
- n. "Initial Attack Force" means the personnel and equipment dispatched for initial attack efforts.

for reimbursement, however an Indirect Rate may be added to the final billing for each fire incident to cover overhead and administration costs as follows:

- 1) If total reimbursement is \$10,000 or less.....15 percent;
- 2) Reimbursement of amounts above \$10,000.....10 percent;
- 3) Reimbursement of amounts above \$50,000.....5 percent.

b. Travel and per diem. The Responsible Agency shall reimburse the agency furnishing assistance for travel and per diem expenses of all such persons engaged in the suppression of each individual wildfire incident pursuant to the authorized per diem rates for each cooperating party.

c. Equipment use. Each agency shall be reimbursed for equipment use at the current, regularly established equipment rates of the furnishing agency. Equipment hired by one party from another shall be returned in the same condition as when received, reasonable wear and tear excepted. Damage in excess of reasonable wear and tear on equipment shall be repaired by the hiring agency if damage was caused by the hiring agency. Equipment lost or destroyed by the hiring agency shall be replaced by the hiring agency.

d. Other expenses. Reimbursement for expendable supplies and expenses incurred in suppressing a wildfire by EMNRD including its Cooperative State Agencies and of Cooperative Federal Agencies, other than as provided under a, b, and c above, shall be on an actual cost basis, or by replacement in kind. All supplies and expenses must be fully documented, including receipts for invoices and documentation shall be furnished to the Responsible Agency

with the reimbursement billing request. Discounts must be passed through to the Responsible Agency.

4. STRICT ACCOUNTABILITY

The parties to this Agreement shall maintain strict accountability for all receipts and disbursements. Itemized statements of cost covering all reimbursable expenses shall be submitted within 120 days, beginning on the day the fire is declared out and in no event later than June 1 of each year, to assure proper encumbrances before the close of the State fiscal year on June 30 and September 1, to assure proper encumbrances before the close of the federal fiscal year on September 30 respectively. Each party to this Agreement shall submit its own request for fire cost reimbursement to the Responsible Agency.

5. WORKMEN'S COMPENSATION

For purposes of Workmen's Compensation coverage, employees of the State of New Mexico, while assigned to assist in suppressing fires on lands of the other parties to this Agreement are covered under the Workmen's Compensation Act by their agencies.

Members of Rural or Municipal Fire Departments are covered for Workmen's Compensation by their respective political entities. Volunteer firefighters are not covered by the Workmen's Compensation Act.

Personnel furnished by a Cooperative Federal Agency assisting in suppressing fires on lands of another cooperating party are covered under applicable Federal Government Regulations pertaining to Workmen's Compensation.

6. THIRD PARTY LIABILITY

Each party shall be solely responsible for the acts and omissions of its officers and employees, as limited by law, resulting in damage or injuries to third parties to the same extent and limits that such party is responsible under applicable law.

This shall not be construed as a waiver of any immunity for liability.

7. FISCAL AUTHORITY

EMNRD shall designate a fiscal authority to collect, authorize and certify billings on behalf of EMNRD's Cooperative State Agencies for Interagency Fire Management Teams assigned to wildfires burning on State and private lands in New Mexico.

8. NO NEW CAPITAL OUTLAY

No property other than reimbursable or expendable materials actually consumed during fire suppression activities shall be allowed as a result of the joint exercise of powers under this Agreement (ie., no capital outlay for new items such as chainsaws, water pumps, generators, and so forth).

9. FIRES ON OR THREATENING LANDS OF BOTH PARTIES.

When the parties are involved in a joint fire suppression effort, it is agreed:

- a. The parties involved will designate in writing an Incident Commander or establish a Unified Command in consideration of the lands threatened and the qualifications of available Incident Commander personnel based on the National Wildland Fire Qualification System.
- b. The parties involved in the fire incident shall participate jointly in strategy sessions to reach mutual agreement on strategy and tactics, subject to final decision by the Incident Commander; but within policy guidelines prescribed by the Responsible Agency.
- c. The Incident Commander shall base decisions on an appraisal of the most appropriate strategy and tactics to control the fire and consideration of the particular land use requirement. If it is necessary to set priorities due to limited suppression forces, the Incident Commander shall consider both the values of resources including

structures and improvements at stake and the natural fuel potential ahead of the fire.

d. Cooperative Suppression costs of such joint action fires shall be prorated based upon the individual cooperating parties' percentage of area affected by the fire. Exceptions to this general approach shall be made:

(i) when it is necessary to expend extraordinary costs to halt the forward spread of fires which threaten lands of only one party;

(ii) when the Incident Commander, with input from the parties involved, determines that the Incident is no longer commonly threatening to multiple Responsible Agencies because it has been controlled and is then only a threat to the other cooperating party or parties. Such determination shall be documented in writing as soon as practicable. Costs incurred up to such point shall be prorated according to acreage involved. Mop-up and patrol on the lands for which the fire has been controlled shall be borne by the Responsible Agency;

(iii) when the fire has been caused by willful or negligent action of an employee or contractor of one cooperating party;

(iv) when the fire is in part on lands under contract for protection by one of the federal agencies. In such case the federal agency holding the contract to provide protection shall pay the prorated share of the costs for those lands.

10. GENERAL PROVISIONS.

a. Report of a Fire. Employees of the parties should take immediate action to report any wildfire discovered by them that occurs on or threatens the lands of other cooperating parties and to assist in fire suppression to the extent of available suppression resources when called

Plans and Initial Attack Zones. In the absence of such meeting, initial attack operations shall be conducted according to the plans attached hereto as lettered exhibits A - E. When the plans are amended by the parties they shall be substituted as lettered exhibits to this Agreement.

f. Liaison. EMNRD's State Forester is the liaison from the state to the federal agencies. The chief executive officer in New Mexico for each of the Cooperative Federal Agencies, or a designee, shall be the liaison for purposes of wildfire suppression. The State Forester shall keep the New Mexico Department of Public Safety advised of developing fire situations with potential for civil disaster.

g. Hazardous Materials. If any of the parties suspect hazardous materials are involved in a fire they should notify the Department of Public Safety's Hazardous Material Emergency Response Coordinator (505-827-9226) or the State Police.

h. National Guard. National Guard assistance shall be sought at the State level through EMNRD's State Forester to the Governor for a Governor's Declared Emergency. The Incident Commander shall advise EMNRD's State Forester upon the termination of the fire emergency for purposes of demobilizing the National Guard. At that time, EMNRD's State Forester shall advise the Governor and the Adjutant General's Office that the fire emergency no longer exists.

i. Review Meeting. Meetings should be held as needed to review the effectiveness of this Joint Powers Agreement and possible amendment pursuant to subparagraph q., below. EMNRD shall be responsible for calling the meeting.

upon by another cooperating party. EMNRD shall include this reporting obligation in any agreements with other state agencies for wildfire suppression.

b. Requests for Aid. Every effort shall be made to obtain suppression resources and assistance from the closest available source and at the earliest possible time in order to reduce suppression costs. In addition, all requests for aid from state agencies shall be made to EMNRD's State Forester or his designee. When suppression resources are no longer available through the local Area Coordination Zone then resource orders for the necessary support shall be made through the Southwest Area Coordination Center.

c. Personnel Qualifications. Fire fighting personnel (except those from Cooperative State Agencies) detailed to emergency fire suppression work shall be qualified according to the then current National Wildland Fire Qualifications Guide (310-1).

d. Law Enforcement. The agency having the primary responsibility for fire protection for the land on which the fire originates shall be responsible to take such law enforcement action as is deemed necessary. When Initial Attack is made by a cooperating party, it should immediately protect and secure the area of fire ignition, or if that is not possible, to gather information and evidence pertaining to the cause of the fire and hold it for investigation and analysis by the party with primary fire protection and law enforcement responsibility.

e. Initial Attack Coordination Meeting. As arranged by EMNRD, the parties shall meet within each of the Initial Attack Operation Areas to review Initial Attack Operating

j. Termination. The term of this Agreement shall be five (5) years. Participation in this Joint Powers Agreement may be terminated by any party by notification in writing to all other parties at least 90 days prior to the intended date of termination. By such termination, no party may nullify obligations already incurred for performance or failure to perform prior to the noticed date of termination.

k. Conflict of Interest. No member of, nor delegate to Congress nor Resident Commissioner shall be admitted to any share or part of this Agreement, nor to any benefit that may arise herefrom; but this provision shall not be construed to extend to this Agreement if made with a corporation for its general benefit. For EMNRD, New Mexico statutes governing conflict of interest shall control this agreement.

l. Equal Opportunity. The extension of benefits under the provisions of this Agreement shall be without discrimination as to race, color, creed, sex, sexual preference or national origin.

m. Waiver of Claims. Each of the parties to this Joint Powers Agreement does hereby expressly waive all claims against every other party for compensation for any loss, damage, personal injury, or death except as otherwise provided herein occurring in consequence of the performance of this Agreement.

n. Appropriations. Nothing in this Agreement shall be construed as obligating any party to expend money in excess of appropriations authorized by State or federal laws. This Agreement is contingent upon sufficient funds and appropriations being made available by the New Mexico

Legislature and appropriations for federal agencies being made available by the United States Congress.

o. Employment Status. Employees of the Federal Cooperative Agencies shall not under the terms of this Agreement become employees of the State of New Mexico. As a result of this Agreement the federal parties, their agents and employees shall not accrue leave, retirement, insurance, bonding, use of State vehicles or any other benefits afforded to employees of the State of New Mexico.

p. Agreement Limited to the Parties. This Agreement shall not be construed to inure to the benefit of persons or parties not signatory hereto and nothing in this Agreement shall be construed as affecting liability or any immunity to persons or entities not signatory hereto.

q. Amendment. This Agreement shall not be altered, changed, or amended except by instrument in writing executed by the parties hereto and approved by the Secretary of the New Mexico Department of Finance and Administration (DFA).

r. Term. The term of this Agreement shall be five (5) years. This Agreement shall not become effective until approved by the Secretary of DFA and all parties. This Agreement shall remain in full force and effect for the term unless terminated pursuant to paragraph 12.j.

s. Review and Audit. The Comptroller General of the United States, DFA, the New Mexico State Auditor and EMNRD and their authorized representatives shall have access to and the right to examine any pertinent books, documents, papers and records relating to any Reimbursable Work for 3 years following the date payment was made. This

Agreement shall be reviewed at least annually and any party obtaining an audit shall make the same available to each of the other parties within thirty (30) days following the audit's completion. Such audits shall fulfill the obligations of the parties for an annual audit hereunder pursuant to the federal Single Audit Act of 1984.

NEW MEXICO ENERGY MINERALS AND
NATURAL RESOURCES DEPARTMENT

By: *Matthew Dea*
Secretary

Date: 7-23-91

FORESTRY DIVISION

By: *Paul Galligan*
State Forester

Date: 7/19/91

UNITED STATES OF AMERICA
USDA, FOREST SERVICE

By: David Kelly
Regional Forester
Southwestern Region
Date: 3/22/91

UNITED STATES OF AMERICA
USDO, BUREAU OF LAND MANAGEMENT

By: Larry L. Woodard
State Director, New Mexico
Date: 2-27-91

UNITED STATES OF AMERICA
USDO, BUREAU OF INDIAN AFFAIRS

By: [Signature]
Area Director
Albuquerque Area Office
Date: 3/28/91

UNITED STATES OF AMERICA
USDO, BUREAU OF INDIAN AFFAIRS

By: [Signature]
ACTING Area Director
Navajo Area Office
Date: 6/7/91

UNITED STATES OF AMERICA
USDOJ, NATIONAL PARK SERVICE

By: 

Regional Director
Southwest Region

Date: 3/4/91

UNITED STATES OF AMERICA
USDOJ, U.S. FISH AND WILDLIFE SERVICE

By: 

~~Acting~~ Regional Director

Date: 5/16/91

APPROVED:
DEPARTMENT OF FINANCE AND ADMINISTRATION

By: David Bloom

Secretary

Date: 8/15/91

FMO Copy

APR 23 1985

JOINT POWERS OPERATING PLAN
SANTA FE UNIT
AGE. No. 16-R3-77-0003
No. - CANMSO 90
No. 66-4

M. V. Melanowski
Forest Supervisor

April 22, 1985
Date

Kenneth J. [Signature]
Chama District, New Mexico State Forestry

April 8, 1985
Date

Joe L. [Signature]
Las Vegas District, New Mexico State Forestry

5-7-1985
Date

John V. Bezy
Pecos National Monument, Superintendent

5/14/85
Date

John [Signature]
Bandelier National Monument, Superintendent

4/25/85
Date

Concave [Signature]
Bureau of Indian Affairs, Area Director

5/2/85
Date

L. Paul [Signature]
Albuquerque District Manager,
Bureau of Land Management

5-2-85
Date

George A. [Signature]
Bernalillo District, New Mexico state Forestry

4/29/85
Date

JOINT POWERS OPERATING PLAN

This Operating Plan is between the United States Department of Interior; U.S. Fish and Wildlife Service (USF&WS), National Park Service (NPS), Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), the United States Department of Agriculture--Forest Service (USFS), and the State of New Mexico; New Mexico State Forestry Division (NMSFD).

I. AUTHORITY

Authority for this Operating Plan is derived from and part of the 1978 Joint Powers Agreement, Section E, General Provisions, Item 5, between the above mentioned Federal and State agencies, which calls for the preparation and adoption of an annual operating plan.

II. PURPOSE

The purpose of this Operating Plan is to establish an agreement for wildland fire initial attack procedures for the Santa Fe Unit, State of New Mexico.

III. RESPONSIBILITY

It is mutually agreed that each party of this Operating Plan will retain ultimate responsibility for all fire suppression action on lands under its administrative jurisdiction.

IV. DEFINITIONS

A. Initial Attack is that initial suppression response to a wildland fire.

B. Escaped Fire is a fire that exceeds the capabilities of the initial response forces.

C. Incident Commander is the first fire qualified supervisory person to arrive at the fire, until relieved.

D. Parent Agency is that agency having ultimate responsibility for fire suppression action on lands under its jurisdiction.

E. Initial Attack Zones are mutually agreed upon areas delineating initial attack responsibilities.

F. Notification of Initial Attack Action is documentation of dispatch action following the report of a fire.

V. DESIGNATED ZONES OF RESPONSIBILITY

A. Initial attack zones have been established based on closest and available fire protection resources, and capabilities of the designated responding agency. A map of these zones is attached hereto and made a part of this plan (Exhibit 1).

The designated initial attack zones are based on historical wildfire incidents and are agreed to by off-setting for Federal and non-Federal expenditures of funds, and thereby mutually beneficial and cost effective. Also, it is agreed that Federal protection (cost) on non-Federal lands will not exceed the protection by the State. Conversely, the State will not expend funds to a greater extent in protecting Federal lands than would the Federal agencies in protecting Federal lands.

B. The agency responsible for initial attack should make reasonable effort to contact private landowners in advance of fire season. The objective of such contacts is to briefly explain the initial attack responsibilities and obtain gate keys or permission by the landowner to cut fences or gates for access to fires. Any damage to private lands for access should be restored following control of the fire. These contacts should be made by local unit personnel who have the assigned initial attack responsibility.

VI. SPECIFIC PROVISIONS

A. Initial Attack A and B Fires

1. Communication. Each agency will submit an initial report to cooperating agencies of their available resources by May 1. This report shall be updated as changes occur. Preferred method is via FATCOM, and once resources have been established the report will be by exceptions only.

a. Prompt verbal (FATCOM, telephone, etc.) notification to the parent agency within 24 hours of the initial dispatch. See sample (Exhibit II).

b. The Notification of Initial Attack Action Report will be submitted to parent agency within 24 hours of the initial dispatch. See sample (Exhibit II).

c. Authorization has been given between agencies to exchange radios and radio frequencies for emergency fire suppression activities. The use of radio frequencies will be limited to emergency mutual aid initial attack usage and will be discontinued immediately after the fire incident ceases to be an emergency.

2. Coordination

a. Initial attack agency shall abide by parent agencies procedures in dealing with ownerships involved.

b. Initial attack agency shall submit its Fire Report to the parent agency within fifteen (15) days after the fire is declared out.

c. The initial attack agency will continue dispatching services on fires for which initial attack actions are being undertaken.

d. Payment. The initial attack agency will bear the initial attack cost unless otherwise negotiated.

e. Coordination. A Multiple Agency Coordination (MAC) group will be established for Multiple A and B fires when such a situation arises.

B. Escaped Initial Attack Fire

1. Communication

a. The initial attack Incident Commander shall notify the dispatcher when the fire has escaped initial attack.

b. The time of escape, date, from whom, and to whom the report is made must be documented by the dispatcher, which must be reported immediately, via FATCOM, to the parent agency. See sample (Exhibit III).

c. In situations where the parent agency requests the initial attack agency to continue suppression actions a Fire Situation Report must be submitted daily to the parent agency.

2. Coordination

a. Parent agency will initiate whatever action is necessary to suppress the fire, and assume suppression control of the fire as soon as qualified fire personnel arrive at the fire.

b. As appropriate, suppression plans shall be negotiated and agreed to by coordinating agencies.

c. The need for a Resource Advisor will be determined at the time the parent agency is notified of the escaped fire.

d. Dispatch. Agencies involved will negotiate and agree who will have the dispatching assignment.

3. Payment

a. Upon notification of an escaped fire, the parent agency assumes fiscal responsibility as per Section B, C, and D, Item 1d of the Joint Powers Agreement.

b. Fires that are entirely on lands under State jurisdiction: Upon notification of an escaped fire, the State will designate a comptroller or authorized individual to approve expenditures and fiscal responsibilities.

c. Initial attack agency shall submit an estimate of reimbursable suppression cost to the State Forestry Division within 2 weeks from the time that the service was rendered. See Exhibit V.

VII. GENERAL PROVISIONS

A. News Releases. Involved agencies will coordinate news release items pertaining to the current fire situation to the media.

B. Mop Up and Abandonment Checks. The initial attack agency will be responsible for mop up and abandonment checks, unless otherwise negotiated.

C. Fire Statistics (Fire Report, Records, etc.)

1. The origin of the fire denotes the parent agency.

2. The parent agency has the responsibility of preparing their statistical fire report. Information for this report shall be provided by the initial attack agency.

D. Effective Date. This plan is effective when all parties have signed this plan.

E. Review and Revisions

1. This plan will be reviewed annually before March 15 of each year.

2. This plan will remain in effect among all the signing parties until one or more of the parties submits a written notice of withdrawal from the plan or requests a change in the plan which would affect the other parties signing the plan. Interim modifications of this plan may be made subject to agreement by parties concerned to correct unworkable situations.

3. Changes in initial attack jurisdictional areas will be made as attachments to this plan and will be signed only by those parties involved in the jurisdictional changes. Amendments will be submitted to the State Forestry Division to be placed in the Joint Powers Operating Plan master file.

4. Copies of the master Joint Powers Operating Plans and maps of initial attack zones will be maintained by the State Forestry Division.

EXHIBIT II
NOTIFICATION OF INITIAL ATTACK ACTION

UNIT:

1. TO (Parent Agency):
2. FROM (I.A. Agency)
3. By (Dispatcher):
4. INCIDENT NAME:
5. DATE OF DISCOVERY:
6. TIME OF DISCOVERY:
7. LAND STATUS:
8. LEGAL T: R: S:
9. GENERAL LOCATION:
10. SIZE:
11. COVER (Fuels):
12. GENERAL FIRE BEHAVIOR:
13. CAUSE:
14. RESOURCES RESPONDING:
15. DATE OF NOTIFICATION:
16. TIME OF NOTIFICATION:
17. REMARKS:

EXHIBIT III

NOTIFICATION OF AN ESCAPED FIRE

1. TO (Parent Agency):
2. FROM (I.A. Agency):
3. BY (Dispatcher):
4. FIRE NAME:
5. LEGAL T: R: S:
6. DATE OF ESCAPE:
7. TIME OF ESCAPE:
8. SIZE:
9. RECEIVED BY (Parent Agency):
10. DATE OF NOTIFICATION:

EXHIBIT V

FIRE REIMBURSEMENT ESTIMATE

SEND TO:

State Forester
New Mexico State Forestry Division
P.O. Box 2167
Santa Fe, NM 87504-2167

DO NOT WRITE IN THIS BLOCK

Date Received: _____

Approved By: _____

Amount of
Encumbrance: _____

Voucher No.: _____

Line Item No.: _____

Date Paid: _____

AGENCY REQUESTING REIMBURSEMENT:

Billing Date

Date Payment Due

FIRE IDENTIFICATION DATA

STATE FIRE NUMBER _____

FIRE NAME (STATE) _____

Dates of Fire Incident: _____



ESTIMATED REIMBURSABLE SUPPRESSION COSTS

I.	Payroll.....	\$ _____
II.	Travel.....	\$ _____
III.	Equipment (Description) _____	\$ _____
IV.	Aircraft (Description of aircraft)	
	A. Fixed wing _____	\$ _____
	B. Rotary _____	\$ _____
V.	Retardant	
	A. Fire Order Numbers _____	\$ _____
	B. Gallons of Retardant Delivered _____	\$ _____
VI.	Supplies	
	A. Fire Order Numbers _____	\$ _____
	B. Type of Supplies Shipped (list)	
	1. _____	\$ _____
	2. _____	\$ _____
	3. _____	\$ _____
	4. _____	\$ _____
	5. _____	\$ _____
	6. _____	\$ _____
	7. _____	\$ _____
	8. _____	\$ _____
	9. _____	\$ _____
	10. _____	\$ _____
VII.	Indirect Cost _____ %	\$ _____

If there are any questions pertaining to this reimbursement request who should be contacted?

NAME _____ Telephone Number (Commercial) _____

2. Extended Attack Incident Management Team Guidelines, Santa Fe Zone

See the following pages.

-People on the Class II Team will be dismissed of the Class III upon request. Replacement will immediately be resource orders upon need.

-The IC may resource order a OPS Chief upon the need of the incident.

CLASS III TEAM OPERATING GUIDE

SANTA FE NATIONAL FOREST

AND

SANTA FE ZONE

I. STATEMENT OF PURPOSE:

1. Not enough qualified resources on the units.
2. Efficiency in managing of fire(s) resulting in cost savings.
3. Minimize resource damage.
4. Run a better organized fire from initial attack for Class II to take over or to assist the unit in controlling the fire.

II. INTRODUCTION

The Class III Team is the basic incident organization to be activated when an incident threatens to become a project size in escaping initial attack and the Escaped Fire Situation Analysis indicates that a Class III Team is needed to manage the incident. The objective of the system is to assure the smooth and rapid build-up of overhead crews and equipment to handle a potential project fire during the first period. This incident team may also be activated in the event of multiple fires on any of the units, where an organization is needed.

The Class III Team will be dispatched to the incident when it becomes obvious to the Unit Head, or Unit Fire Management Officer, that the unit initial attack resources are not adequate to handle the incident(s).

The Class III Team Duty Roster will be for the critical part of fire season. This will allow individuals on the roster time to adjust work plans. Under normal fire weather conditions, the roster will span April to July. In the event the fire weather dictates otherwise the team member will be notified.

Team assignees for this period must remain in reasonable contact with the Zone Dispatcher. To be effective, the team must be ready to leave for the incident within one hour after a call out. Any person assigned to the team as primary staff not able to perform their duty, has the responsibility to the Dispatcher

to fill in for his/her behalf, in advance and notify the Forest Dispatcher of change.

The Class III Team will manage its assigned incident until it is controlled or until a Class II has arrived and is assigned management of the fire by the unit head or acting.

III. ACTIVATING THE CLASS III TEAM

The team will be activated and dispatched upon the request of the Unit Head or the Unit Fire Management Officer. The request for the team should go directly to the Forest Dispatcher with information where to assemble.

The following actions will take place when the Class III Team Team is requested:

1. The Dispatcher will call the team members by radio and/or telephone as listed for that day.
2. Immediately the team member will respond with their kits to the assembly point or unit.
3. The IC review and amend the EFSA as need be with the unit head for unit head approval.
4. The incident unit office will supply the proper maps, aerial photos, pre-attack etc., and send to assembly point.

A great deal of the success of this system depends upon the concept of teamwork, and teamwork can be accomplished only through the organization that will take place within the team prior to actually going to work on the incident.

IV. LINES OF AUTHORITY

In the event of a fire on either of the units being managed by the Class III Team, the Incident Commander will work directly for and receive delegation of authority from, the Unit Head on whose unit the fire occurs. In the event the fire is on more than one unit, the two unit heads will decide who will provide the delegation of authority.

V. TRAINING

Success of the Incident Management System is dependent upon the individual involved feeling sure that they are prepared to accept full responsibility for the job assigned. Each individual should be sure that they fully understand what is expected. Before the fire season, a short training session will be conducted for all the team staff and as many alternates as possible.

VI. REQUEST FOR A CLASS II INCIDENT MANAGEMENT TEAM

A Type II Incident Management Team will be requested and activated when it is apparent the incident, 1) threatens to become project size and the EFSA confirm the need for a larger Team to manage the incident, 2) the Incident Commander and the Unit Head decides the need for the Type II Team.

If the Class II Team is requested, the IC, the Unit Head, and the Forest FMO, should be prepared to give the Class II Team IC a size up, person power and equipment needs.

ADDENDUM A

TO THE

SANTA FE ZONE EXTENDED ATTACK TEAM OPERATING GUIDE

I. The following positions will be activated as full team members should an incident for which the team is assigned become a threat to Los Alamos County:

- (A) AGENCY REPRESENTATIVE(S) TO THE INCIDENT COMMANDER:
 - (1) Los Alamos County FD Chief D. MacDonald (alternate TBA)
 - (2) LANL Representative G. VanTiem (Alt. E. Nettles)
- (B) INFORMATION OFFICER (IOFR)
 - (1) LANL:
 - (2) County:
- (C) STRUCTURAL PROTECTION GROUP SUPERVISOR
 - (1) LAFD Dep. Chief D. Tucker
- (D) STAGING AREA MANAGER, LAFD: TBA
- (E) SUPPLY SPECIALIST, LAFD: TBA
- (F) COMMUNICATIONS SPECIALIST, LAFD: TBA
- (G) SUPPORT DISPATCHER (EDSD), Assigned to EOC. (Resource Order).
- (H) SAFETY OFFICER (SOFR)-Assigned by Team (Resource Order)

II. Qualifications.

Of the positions listed above, all should have completed the Basic ICS Course or equivalent.

The AGENCY REPS should come with an appropriate level of administrative authority to participate actively in the decisionmaking process. These positions are to remain with the team until properly relieved.

The STRUCTURAL PROTECTION GROUP SUPERVISOR should be agency certified to the level appropriate to this position.

The SUPPORT DISPATCHER will be qualified to that level within NIFQS.

III. Activation.

The Incident Commander will request that one or more of these positions be activated as required for the safe and efficient management of the incident. All requests will be processed through the Santa Fe Interagency Zone Dispatch (505) 438-7800.

(NOTE: Position descriptions for special team personnel listed above are maintained by the Incident Commander, with copies in the Bandelier Fire Management Office)

3. Memorandum of Understanding for Mutual Assistance in Prescribed Burning, Santa Fe National Forest and Bandelier National Monument

See the following pages.



IN REPLY REFER TO.

John - 744
United States Department of the Interior

NATIONAL PARK SERVICE
Bandelier National Monument
HCR 1, Box 1, Suite 15
Los Alamos, New Mexico 87544-9701

August 14, 1996

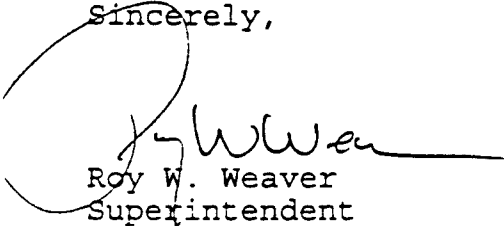
Mr. Donald DeLorenzo
Santa Fe National Forest
P.O. Box 1689
Santa Fe, New Mexico 87504

Dear Mr. DeLorenzo:

Enclosed is a signed original Interagency Agreement between Santa Fe National Forest and Bandelier National Monument . If you have any questions please contact Tammy K. Gallegos at (505)672-3861 ext. 504.

We look forward to working with you and your staff.

Sincerely,


Roy W. Weaver
Superintendent

Between
U.S.D.I. National Park Service, Bandelier National Monument
and
U.S.D.A. Forest Service, Santa Fe National Forest

- I. Purpose: By this agreement, the Bandelier National Monument (hereinafter referred to as the Park Service) agrees to provide to the Santa Fe National Forest (hereinafter referred to as the Forest Service) the services of Park Service employees and equipment to assist them in the support of prescribed burning operations. Services are provided on a reimbursement basis.
- II. Authority: The authority for the Park Service to enter into this agreement with the Forest Service and to place orders for work and services is the Economy Act of June 30, 1932 (31 U.S.C. 1535), and P.L. 102-381, Department of Interior and Related Agencies Appropriations Act, 1993.
- III. Scope: The work will consist of either site preparation, line construction, ignition of burn units, and holding as instructed by the agency person responsible for the project.
- IV. Reimbursement: The Forest Service agrees to identify the personnel and equipment needs in the performance of this agreement. See attached financial plan.

The maximum total cost liability to the Forest Service for this instrument is \$10,000. Transfer of funds to the Park Service will be through an On-Line Payment and Collection System (OPAC) billing. The OPAC billing document which the Park Service will prepare shall contain the following information as the first line of the description or the reference section:

FS Account Data: 0310
Management Code: 036353 - Override T010
Instrument Number: R3-10-96-0012
Agency Location Code: 12-40-0001
Budget Object Code: 2550

Send bill to: National Finance Center, ATTN: OPAC
P.O. Box 60000
New Orleans, La. 70160

A detailed list of charges incurred will be made available upon request. Any excess funds not used for the agreed costs shall be refunded to the Forest Service upon expiration of this instrument.

Both parties can agree to waive reimbursement on a case by case basis.

V. Other Provisions:

- A. Modification: Modifications within the scope of this instrument shall be made by mutual consent of the parties, by the issuance of a written modification, signed and dated by both parties, prior to any changes being performed. The Forest Service is not obligated to fund any changes not properly approved in advance.
- B. Access to Records: Give the Forest Service or Comptroller General, through any authorized representative, access to and the right to examine all books, papers, or documents related to this instrument.
- C. Termination: This agreement shall be considered effective upon execution by both parties and will expire September 30, 1996. Either party, in writing, may terminate the instrument in whole, or in part, at any time before the date of expiration. Neither party shall incur any new obligations for the terminated portion of the instrument after the effective date and shall cancel as many obligations as is possible. Full credit shall be allowed for each parties expenses and all non-cancellable obligations properly incurred up to the effective date of termination.
- D. Restriction for Delegates: Pursuant to Section 22, Title 41, United States Code, no member of, or Delegate to, Congress shall be admitted to any share or part of this instrument, or any benefits that may arise therefrom.
- E. Obligations: Nothing herein shall be considered as obligating the Forest Service to expend or as involving the United States in any contract or other obligations for the future payment of money in excess of funding approved and made available for payment under this instrument and modifications thereto.
- F. The principal contacts for this instrument are:

Phil Neff
USDA Forest Service
PO Box 150
Jemez Sprs., NM 87025
(505) 829-3535

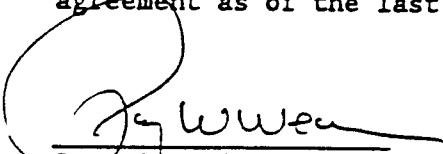
John Lissoway
USDI National Park Service
Hcr 1, Box 1, Sta. 15
Los Alamos, NM 87544
(505) 672-3861

G. Availability of Funds: Funding in the amount of \$10,000 is currently obligated for performance of this instrument through Sept. 30, 1996. The Forest Service obligation for performance of this instrument beyond this date is contingent upon the availability of appropriated funds from which payment can be made. No legal liability on the part of the Forest Service for any payment may arise for performance under this instrument beyond Sept. 30, 1996, until funds are made available to the Forest Service for performance and until it receives notice of availability. Contingent upon Forest Service approval of continuance of work, a written modification to the instrument shall be issued to include funding for the subsequent performance period as described in the approved operating or financial plan, or budget.

H. Extended Term: The Forest Service, by written modification to the instrument, may extend the term for subsequent performance periods not to exceed a total duration of 5 years from the execution date of this instrument, including the subsequent performance periods.

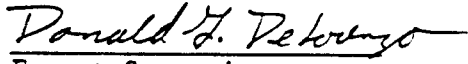
I. Funding Equipment and Supplies: Federal funding under this instrument is not available for reimbursement of cooperator purchase of equipment and supplies.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the last date written below.


Superintendent

Bandelier National Monument

8/1/96
Date


Forest Supervisor

Santa Fe National Forest

7/18/96
Date

FINANCIAL PLAN

Funding in the amount of \$10,000, shall be used by the Park Service for payment of prescribed burning operations as follows:

Salary, Overtime, Field Perdiem	\$10,000
---------------------------------	----------

4. **Memorandum of Understanding for New Mexico Smoke Management Plan**

See the following pages.



United States
Department of
Agriculture

Forest
Service

Southwestern
Region

**COPY FOR YOUR
INFORMATION**
517 Gold Avenue SW
Albuquerque, NM 87102-0084
FAX: (505) 842-3800
V/TTY: (505) 842-3292

File Code: 1580 ✓
Route To: 5170

Date: JUN 17 1997

Subject: New Mexico Smoke Management Memorandum of Understanding
Number 16-R3-07-0006

To: Mark E. Weidler, Cabinet Secretary, New Mexico Environment Dept.
John E. Cook, Regional Director, Intermountain Region, NPS
William C. Calkins, State Director, BLM, NM
Nancy M. Kaufman, Regional Director, FWS
Ray Powell, Jr., State Land Commissioner, NM State Land Office
Jennifer A. Salisbury, Cabinet Secretary, NM Department of Energy,
Minerals and Natural Resources

Enclosed is a copy of the New Mexico Smoke Management Memorandum of Understanding (MOU) 16-R3-07-0006 between New Mexico Environment Department, National Park Service, Bureau of Land Management, Fish and Wildlife Service, New Mexico State Land Office, and New Mexico Department of Energy, Minerals, and Natural Resources.

This MOU becomes effective immediately until 2002. The cooperative effort of all agencies involved in the use of prescribed fire for accepted ecosystem management practices is essential to the success of this plan.


JOHN R. KIRKPATRICK

Car

CHARLES W. CARTWRIGHT, Jr.
Regional Forester

Enclosure

**COPY FOR YOUR
INFORMATION**

*This is what Ron
Moody sent me.*

New Mexico Smoke Management

Memorandum of Understanding

PURPOSE

This MOU defines how the signatory land and resource management agencies and the New Mexico Environment Department (NMED) will work together in managing smoke from prescribed burning to preserve air quality and limit impacts to excellent visibility in New Mexico.

AUTHORITY

Federal Authority.

Federal Clean Air Act, (Public Law 101-549);
Economy Act of June 30, 1932, as amended (31 U.S.C. 1535);
National Wildlife Refuge System Administrative Act of 1966 as amended (80 Stat. 927; 16 U.S.C. 666dd-668ee);
Reciprocal Fire Protection Act of 1955 (42 U.S.C. 1856);
Organic Act of June 4, 1897, as amended,
Multiple-Use Sustained Yield Act of June 12, 1960 (16 U.S.C. 528-31); and
Forest and Rangeland Renewable Resources Planning Act of 1974 as amended by the National Forest Management Act (16 U.S.C. 1602); and Interagency Master Agreement 83-SIE-0015.

State Authority

New Mexico Air Quality Control Act" 74-2-1 et seq., especially sections 74-2-5, "Duties and Powers of Board;" 74-2-5.2, "State Air Pollution Control Agency," and Section 74-2-12, "Enforcement."

OBJECTIVES

1. To minimize the generation and/or impacts of smoke in New Mexico when prescribed burning is necessary, particularly in smoke-sensitive areas and in important views in Class I areas.
2. To encourage, consider, and use alternative treatments when they are ecologically beneficial, technologically feasible, and economically reasonable.
3. To assure that no National Ambient Air Quality Standards, New Mexico Air Quality Standards or air quality control regulations are violated.
4. To develop and implement an interagency system among land management agencies to monitor and inventory emissions from prescribed fires and wildfires.
5. To cooperate in developing, exchanging and presenting training for employees to promote their understanding of smoke management, fire ecology, and regulatory requirements as resources allow.

6. To establish and maintain communication and information exchange among all agencies with responsibilities for smoke management on prescribed fires.

IMPLEMENTATION

In order to meet these objectives, the signatories have developed and hereby agree to abide with the attached New Mexico Smoke Management Plan.

The signatories also agree to meet annually during the second week of January. This annual meeting will be scheduled by the signatories of this MOU on a rotating basis beginning with the New Mexico Environment Department to update maps and contact points (persons), to evaluate the prescribed fire program and the permitting and data collection system in New Mexico, and review and modify the New Mexico Smoke Management Plan where necessary.

The signatories further agree:

1. That nothing herein shall be construed in any way as limiting the authority of the NMED in carrying out their legal responsibilities for management or regulation of air quality. The requirements of (New Mexico Administrative Code 20 NMAC 2.60), Open Burning, shall remain in effect. Permit applications reviewed under the Understanding shall be reviewed under 20 NMAC 2.60 as well as the criteria in this document;
2. That nothing herein shall be construed in any way as limiting the legal authority of the Federal Land Management agencies (FLM) or State agencies, to include the Forest Service, National Park Service, Bureau of Land Management, Fish and Wildlife Service or Department of Energy, Minerals and Natural Resources in connection with the proper administration and protection of public lands in accordance with Federal or state laws and regulations;
3. That nothing in this Understanding shall be construed as obligating the signatories to expend funds in any contract or other obligations for future payment or service in excess of those available or authorized for expenditure;
4. That this Understanding shall become effective as soon as it is signed by the parties hereto and shall continue in force unless terminated by any party upon thirty (30) days notice in writing to the other of intent to terminate upon an indicated date;
5. That any previous management agreements among the signatories concerning prescribed burning pollution management are revoked upon approval of this Understanding by all parties;
6. That this Understanding may be amended upon approval of all signatories by executing an addendum containing the desired amendments;
7. That each and every provision of the Understanding is subject to the laws of the State of New Mexico, the laws of the United States, the regulations

of the Secretaries of Agriculture and Interior, and the regulations of the State of New Mexico.

8. That prescribed burning for wildlife habitat improvement, removal or reduction of fuel, maintenance of natural ecosystems and cultural scenes, protection of the urban interface, and other ecosystem management practices is an important tool.
9. Permittees are to ensure that Public Notification plans are developed and implemented for each prescribed fire activity.
10. That Fire Managers, Public Information Officers, and other Agency individuals contacting the public will know details about the prescribed burning program, project(s), and objectives of the burn. Prescribed Fire handouts and other developed educational material can enhance the process.

Officials Not to Benefit

No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this Understanding, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Understanding if made with a corporation for its general benefit.

Non Discrimination

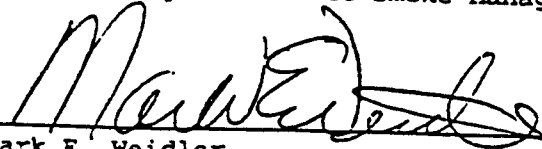
During the performance of this Understanding, the cooperators agree to abide by the terms of Executive Orders on non-discrimination and will not discriminate against any person because of race, color, religion, sex or national origin. The cooperators will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex or national origin.

Term of Understanding

This Understanding will take effect upon signature, and expire on December 31, 2002. It may be extended with a letter of reaffirmation for a period not to exceed five additional years.


Signatories

Agreed to by New Mexico Smoke Management Signatories:



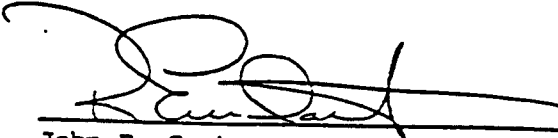
Mark E. Weidler
Cabinet Secretary, New Mexico Environment Department
New Mexico Environment Department
3/6/97

Date



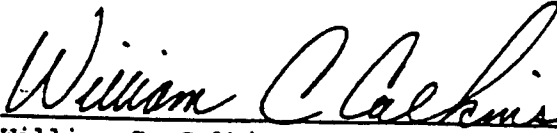
JOHN R. KIRKPATRICK
6 Charles W. Cartwright, Jr.
Regional Forester, Southwestern Region
U.S.D.A., Forest Service
JUN 17 1997

Date



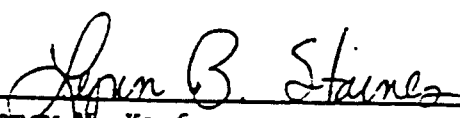
John F. Cook
6 Field Director, Intermountain Field Area Region
U.S.D.I., National Park Service
5/19/97

Date



William C. Calkins
State Director
Bureau of Land Management, New Mexico
5/5/97

Date



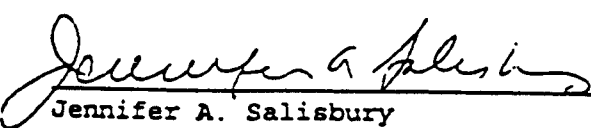
for Nancy W. Kaufman
Regional Director
U.S.D.I., Fish and Wildlife Service
5/8/97

Date

(Not signatory - see attached letter)

Ray Powell, Jr.
State Land Commissioner
New Mexico State Land Office

Date



Jennifer A. Salisbury
Cabinet Secretary
New Mexico Department of Energy, Minerals and
Natural Resources
7/21/97

Date

New Mexico Smoke Management Plan

I. Policy and Definitions

A. Cooperation. The cooperative effort of all agencies involved in the use of prescribed fire for accepted ecosystem management practices is essential to the success of this plan.

1. Training. The land management agencies and the New Mexico Environmental Department will develop, exchange and present interagency training as resources allow to promote understanding of the regulatory context and effects of air pollution as well as fire ecology and smoke management. The responsible parties are the Southwest Area Fire Training Committee and the Air Quality Bureau - New Mexico Environment Department.

B. Zone Smoke Management Plans. Each existing administrative fire suppression zone board (Appendix A) shall develop a zone management plan (available upon request) to best meet the objectives of this agreement. Each zone is to cooperate on management of smoke within their airshed (Appendix B). The minimum components of a zone plan are as follows:

1. Definitions
2. Smoke-Sensitive Areas
3. Best Management Practices
4. Airsheds
5. Training
6. Monitoring
7. Class I areas

Each agency is responsible for applying for specific burning permits.

Coordination between zones will be the responsibility of the Southwest Fire Management Board.

C. Smoke Management. Each land management agency signatory to the MOU is responsible for proper smoke management for prescribed fires they conduct and, on a case-by-case basis, shall identify and implement appropriate smoke management techniques to minimize the amount and/or impact of smoke produced.

1. Clarification of Terms.

a. Smoke management includes but is not limited to techniques to dilute smoke, to reduce emissions, the identification and avoidance of smoke-sensitive areas to smoke impacts, and coordination among land management agencies.

b. Prescribed fire includes both management ignited prescribed fire (MIPF), and prescribed natural fire (PNF).

i. MIPF is the controlled application of fire to wildland fuels in either their natural or modified state, under such conditions of weather, fuel moisture, soil moisture, etc., as allows the fire to be confined to a predetermined area and at the same time meet the management objectives for which the fire was planned.

ii. PNF is any fire caused by lightning which is allowed to burn under prescribed conditions and in a predetermined area to meet specific management objectives.

c. Wildfire is any fire that is not a prescribed fire, and is therefore subject to appropriate suppression (see section II D.1).

d. Smoke-sensitive areas include but are not limited to Class I areas as well as other scenic and important views especially during times of significant visitor use (see sections I.D.1 and II.F.4), urban and rural population centers, schools, hospitals, nursing homes, transportation facilities such as roads and airports, recreational areas, and other locations that may be sensitive to smoke impacts for health, safety, scientific, or aesthetic reasons.

e. Suppression action includes any activity in which the responsible fire control agency personnel are actively trying to confine, contain or control the fire. Use of natural fire barriers such as cliffs, rocks, or rivers, etc., to contain the fire shall be regarded as part of the suppression strategy.

f. Fire management zones are geographic areas of the state involving two or more agencies for coordination of fire activities (Appendix A).

D. Visibility. Each land management signatory shall, on a case-by-case basis, explicitly consider potential visibility impacts of smoke in Class I areas and other smoke-sensitive areas. Each signatory shall minimize smoke impacts through application of appropriate smoke management techniques, including scheduling burns outside times of significant visitor use and employment of alternatives to prescribed burning to the extent they are environmentally acceptable, technologically feasible and economically reasonable.

1. Clarification of Terms.

a. The explicit consideration of visibility in a prescribed fire plan means that within each prescribed fire plan, visibility in smoke-sensitive areas shall be identified and, on a case-by-case basis, smoke management techniques applied both in planning and in implementation to minimize smoke impacts.

b. Smoke-sensitive areas that are scenic and/or important views shall be identified in the zone management plans. Zone smoke management plans will be coordinated by each Zone Board.

E. Prescribed Fire Contingency Plan. In prescribed fire plans, each land management agency will have an operational plan identified enabling it to reduce fire emissions, eliminate ignitions in certain areas, or take appropriate suppression action. Contingency plans will be implemented when meteorological conditions warrant, the New Mexico Environment Department determines that National or State Air Quality Standards are or will be exceeded, and/or the responsible land management agency anticipates that the prescription for a particular fire will be exceeded.

II. Permits.

A. Authority.

1. Federal Clean Air Act. Section 118(a), "Control of Pollution from Federal Facilities," Section 110, "Implementation Plans", Section 116, "Retention of State Authority"; Section 169(a), "Visibility Protection for Federal Class I Areas"; Section 176(c), "Limitations on Certain Federal Assistance," Section 109, "National Ambient Air Quality Standards."

2. New Mexico Air Quality Control Act. Section 74-2-5.2. "State Air Pollution Control Agency;" Section 74-2-5, "Duties and Powers of Board;" and Section 74-2-12, "Enforcement."

3. FLM Authority to enter Memorandum of Understanding.

Economy Act of June 30, 1932 (31 U.S.C. 686); National Wildlife Refuge System Administrative Act of 1966 as amended (80 Stat. 927; 16 U.S.C. 666dd-668ee); Reciprocal Fire Protection Act of 1955 (42 U.S.C. 1856); Organic Act of June 4, 1897, as amended; Multiple-Use Sustained Yield Act of June 12, 1960 (16 U.S.C. 528-31); and Forest and Rangeland Renewable Resources Planning Act of 1974 as amended by the National Forest Management Act (16 U.S.C. 1602).

B. Permit Application for Planned Ignition Prescribed Fires. No MIPF may be initiated without first obtaining an annual permit from the NM Environment Department. (See exemptions for agricultural burning, IIE.) Signatories to the Memorandum of Understanding shall submit a New Mexico Environment Department application to the Department. Proposed burning projects will be submitted every other month beginning in January.

1. Application Form. An annual application for all burns planned, from January 1 through December 31, must be submitted to the NMED office in Santa Fe. Computer generated versions of the application forms are acceptable.

2. Acceptable Projects. Acceptable projects within this Memorandum of Understanding include but are not limited to:

- a. Treatment or prevention of hazardous fuel accumulation.
- b. Slash disposal within contract areas (e.g. timber management, road construction, thinning, etc.)
- c. Wildlife habitat improvement.

- d. Forest stand improvement.
- e. Insect and disease control.
- f. Site preparation for revegetation.
- g. Water yield improvement.
- h. Maintenance of natural ecosystems.
- i. Maintenance and enhancement of threatened and endangered species habitat.
- j. Other vegetative management improvement projects.
- k. Cultural scene maintenance.

3. Review of Application. The Department, after review and decision, will inform the applicant that the permit is approved, approved with conditions, or denied within 35 days after receipt of a complete application. In reviewing an application, the Department will recognize the land management objectives for which the prescribed fire is proposed by the applicant and must consider the following factors:

- a. The existence of no practical alternative to burning as determined by the National Environmental Policy Act (NEPA) process.
- b. Smoke impacts due to proximity of populated areas, and projected meteorological conditions.
- c. Potential contribution to area air pollution.
- d. Climatic conditions on the day or days of burning.

4. Dissemination of Permits. Copies of all permits reviewed under this plan shall be sent by the Department to the appropriate agencies as determined by the Department.

5. Albuquerque/Bernalillo County. Any permit applications for open burning on Federal or State lands within the jurisdiction of Albuquerque/Bernalillo County will not be included within the terms of this MOU.

C. Prescribed Natural Fire (PNF)

1. Permit Application. Application for PNF areas shall be made on an annual basis. An operating plan including the prescription and map showing the area for PNF shall be included with each initial application. The applications will be reviewed and approved, approved with conditions, or denied. Subsequent annual applications for approved areas need not include plan and maps, but only minor necessary changes for that area and the permit application form.

2. Notification of Department. Notification by telephone to the Air Quality Bureau Enforcement Section of PNF fires is required if a fire exceeds ten acres. Calls will be made within 2 hours after declaration of Prescribed Natural Fire.

D. Suppression and Monitoring. If at any time the responsible land management agency or NMED, in consultation with the other agencies determines that the conditions of the permit are not being met the responsible parties shall promptly initiate appropriate suppression action.

Factors that the NMED will consider in this determination include but are not limited to:

- a. National or State Ambient Air Quality Standards, or air quality control regulations are violated.
- b. National or State Ambient Air Quality Standards, or air quality control regulations are expected to be violated. If air quality standards are expected to be violated, the responsible land management agency may request that NMED provide a person to assist with monitoring.
- c. Modeled data that indicates expected violations of any National or State Ambient Air Quality Standard.
- d. Monitored data that indicates expected violations of National or State Ambient Air Quality Standard.
- e. Impact of the fire to smoke-sensitive areas: especially rural or urban population centers.
- f. Citizen complaints.
- g. National Weather Service Fire Weather Forecast predictions.
- h. Fuel conditions.
- i. Existing and predicted size of the fire.

During suppression action consultation, the affected land management agencies will provide input on agency policy and direction. Consultation will include firefighter safety, public safety, projected suppression costs, and resource availability.

1. Wildfire. Wildfire will not require a permit since appropriate suppression action is required.

2. Monitoring. If pollutant levels are anticipated to exceed National or State Ambient Air Quality Standards, air quality control regulations, or significantly impact visibility, the New Mexico Environment Department may require the responsible land management agency to monitor and/or model pollutants generated from a particular prescribed fire or wildfire. The New Mexico Environment Department may assist in identification of instrumentation, site selection, installation of instrumentation, operation, calibration, quality assurance, quality control, laboratory analysis, data interpretation, and supplies. Upon request the responsible land management agency shall within 90 days furnish the New Mexico Environment Department with a fire activity report for a particular prescribed fire or wildfire.

E. Projects not Covered. Projects not listed or not considered part of forest and public land management projects must submit an application for open

burning permit for specific projects to the local NMED district office. The Department will process those complete applications within 20 days as they are received throughout the year. The Department is prohibited by regulation from requiring permits for agricultural burning. Agricultural burning is defined as annual crops (oats, barley, etc.) or range burning (to improve grazing for plant composition and species). Currently, the Department's air quality control regulation does not require a permit for agricultural burning.

F. Permit Conditions. The following permit conditions shall apply on permits.

1. Air Pollution Emergencies and Alerts. Permits will not be valid during periods of air pollution emergency or alert in the area of burning. At the determination of such a period, the Department shall notify each signatory of the Memorandum of Understanding.

2. Smoke Management. In order to minimize smoke impacts and emissions, each land management agency signatory shall apply the best smoke management techniques. It is recognized that no two fires are alike in terms of smoke emissions and impacts. Neither are any two fires alike in the smoke management options available. Therefore, the land manager will select appropriate smoke management techniques on a case-by-case basis. While considering the maximum application of smoke management options, it is the responsibility of the land manager to select the appropriate emission reduction and impact minimization techniques for each fire.

a. All ignitions shall be done during periods conducive to good ventilation. Each signatory shall use the meteorological information produced by the National Weather Service Fire Weather Forecaster before burning. Each signatory shall endeavor to use the best meteorological information reasonably available to assure burning during conditions of at least "good" smoke dispersal.

b. For planned ignitions, a single test fire may first be ignited to indicate local mixing depths.

c. For piled material, all piles shall be cured and as free of dirt as possible. Auxiliary fuels may be used as necessary to induce proper ignition.

3. Compliance. The determination of compliance with air quality standards shall be the responsibility of the NMED. Compliance with air quality standards will be determined through modeling, emissions inventories, and air quality monitoring.

4. Visibility. Potential visibility impacts of smoke from any prescribed burn shall be explicitly considered and factored into the prescription for that burn.

5. Liability. The granting authority and the employees or agents thereof, in the issuing of a permit, do not assume any responsibility or liability for any hazardous condition created by the permittee which results in

damage to the person or property of the permittee, or the person or property of any third person.

6. Inspection by Department. All prescribed burning operations shall be subject to inspection by the Department.

7. Local Regulations and Notifications. The permit is for compliance with State air pollution control requirements only and is not a permit to violate any existing local laws, rules, regulations, or ordinances regarding fire. The permittee will notify the appropriate local agencies as required in their burn plan of intent to burn and the location of each burn. Land managers must be certain that their actions comply with all procedures contained in local air pollution control regulations and agreements.

8. Expiration Date. Each permit is valid only for the dates indicated. The permittee must note the expiration date of each permit.

9. Revocation of Permit. If at any time the Department determines that any condition of the permit is not being complied with, the permit may be revoked for the specific project where the non-compliance is occurring. If the agency is unable to correct the non-compliance condition within a mutually agreeable time, the permittee will immediately take the necessary control suppression tactics at the site of the non-compliance. In addition to revocation of the permit, the Department may take any other enforcement action authorized under State or Federal statutes, rules and regulations.

10. Actual Burning Activity. As a condition of the permit, the actual activity that occurred with each permitted burn must be reported to the Department (see section III below).

11. Other Conditions. Other conditions required for smoke management may be added to the permit if deemed necessary by the Department and in consultation with the permittee.

III. Annual Reporting of Fire Activity.

A. Annual Report. Each permitted user of prescribed fire shall provide the Department with an annual reporting of fire activity (Forms A, B, & C attached) by March 1 for the previous calendar year's activities.

1. MIPF. Permitted MIPF shall be reported. MIPF that were not carried-out need not be reported. If no information is received for a permitted burn the Department will assume no fire activity occurred.

2. PNF. Permitted PNF activity shall be reported for each fire area only when fire activity in the area occurred. If no information is received for a permitted natural fire area the Department will assume no fire activity occurred.

B. Wildfire. The Department asks signatories to annually provide (by March 1) information on wildfire that exceeds 20 acres that occurred on their lands or on land about which they receive information during the previous calendar year. If a prescribed fire is later declared a wildfire, the information should be reported as a wildfire.

C. Purpose. Annual reporting on the attached MOU forms A, B, and C as well as the Summary of Burn Accomplishment Evaluation will provide a better understanding of fire activity and its impacts in New Mexico. Combined with appropriate emission factors for each vegetative type indicated, the information provided will allow the Department to have a emission inventory for VOC's, TSP, PM-10, PM-2.5, and visibility impacts due to fire. To develop the emission inventory, the fire activity report provided by the land management agencies needs to demonstrate where, when, and how much fuel was burned; what types of fuel were burned; and how the emissions from the burn were determined. Therefore the fire activity reports shall include location, time, fuel types, (vegetative type, piles or in-situ, etc.), fuel loadings (e.g., tons per acre, pile weights), number of acres or piles burned, emissions calculated (pounds per ton, acre, or burn), emission rates (e.g. pounds per minute, tons per hour), and the emission factors used in the calculations.

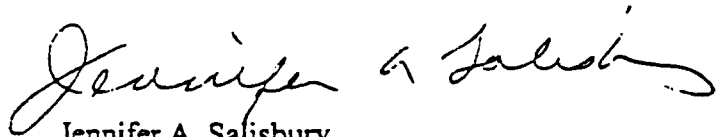
It is understood that in reporting on actual prescribed and wildfire activity, the signatories will use the best information feasible that is reasonably available. Signatories recognize that no models or precise factors are currently available to estimate VOC emissions.

Limitation of Signature

The Energy, Minerals and Natural Resources Department and its Forestry Division are not, by state statute, land management agencies and, therefore, signs this agreement pursuant to the following limitations. The Forestry Division provides technical assistance to state agencies and private landowners with land management responsibilities. These State agencies and private landowners are responsible for securing the required permits for burning from the New Mexico Environment Department to comply with the New Mexico Air Quality Control Act and New Mexico Administrative Code 20 NMAC 2.60.

The Energy, Minerals and Natural Resources Department-Forestry Division as a signatory to the New Mexico Smoke Management Memorandum of Understanding agrees to provide the following cooperative coordination pertaining to smoke management in New Mexico:

1. As a member of the "Zone Boards" and the Southwest Fire Management Board the Forestry Division cooperate on management of smoke within the airsheds in New Mexico by assisting in the development of zone management plans for smoke management and setting priorities for burns within each zone.
2. Provide information to "Zone Boards" on planned prescribed burns on state or private lands where the Forestry Division has provided technical assistance in the development of the prescribed burn plan and will be assisting the land management agency or private landowner with implementing the prescribed burn.
3. Cooperate with the Federal Land Management Agencies, state agencies, private landowners in educating the public on the use of prescribed fire as a land management tool to restore forest health in New Mexico.
4. Cooperate with the Federal Land Management Agencies, state agencies, private landowners in providing information on all prescribed fire activities within the "Zones".



Jennifer A. Salisbury
Cabinet Secretary

New Mexico Department of Energy, Minerals and
Natural Resources

Date: 4/21/97

APPENDICES

APPENDIX A. MOU Forms A, B, and C

APPENDIX B. Burn Accomplishment Evaluation

APPENDIX C. Emissions Calculation Forms for PM-2.5, PM-10, TSP, & VOC's

APPENDIX D. Permit Application and Reporting of Opening Burning.

APPENDIX E. Map of existing fire management zones in New Mexico.

APPENDIX F. Map of airsheds in New Mexico.

APPENDIX A

(pg. 1 of 3)

ANNUAL REPORTING - MEMORANDUM OF UNDERSTANDING

MOU - FORM A

MANAGEMENT IGNITED PRESCRIBED FIRE (MIPF)

DATE: _____

REPORTING AGENCY: _____

TOTAL ACREAGE: _____

How was fuel loading determined? _____

FUEL TYPES	PERCENT OF ACTUAL ACREAGE	FUEL LOADING (tons/acre)	PERCENT CONSUMPTION
GRASS			
SAGEBRUSH			
PINYON/JUNIPER			
ASPEN			
PINE/CONIFER			
OTHER			
TOTAL			

FOR PILE BURNS:

NUMBER OF PILES: _____

AVERAGE VOLUME/PILE (Cu Ft.): _____

AVERAGE % CONSUMED: _____

FUEL TYPES	PERCENT OF TOTAL *
SAGEBRUSH	
PINYON/JUNIPER	
ASPEN	
PINE/CONFIER	
OTHER	

* Note: Percent of Total must total 100%

Signed: _____
Name and Title

Date: _____

ANNUAL REPORTING - MEMORANDUM OF UNDERSTANDING

MOU - FORM B

PRESCRIBED NATURAL FIRE ACTIVITY (PNF 10 Acres +)

DATE: _____

AGENCY: _____ ADMINISTRATIVE UNIT: _____

BURN NAME: _____ COUNTY: _____

BURN BEGAN: _____ BURN ENDED: _____

TOTAL ACREAGE: _____

FUEL TYPES	PERCENT OF ACTUAL ACREAGE	FUEL LOADING (tons/acre)	PERCENT CONSUMPTION
GRASS			
SAGEBRUSH			
PINYON/JUNIPER			
ASPEN			
PINE/CONIFER			
OTHER			
TOTAL			

SUMMARY OF FIRE ACTIVITY: (Date, Acres Consumed, Impacts on Smoke Sensitive Areas)

Signed: _____ Date: _____
 Name and Title :

APPENDIX A

(pg. 3 of 3)

ANNUAL REPORTING - MEMORANDUM OF UNDERSTANDING

MOU - FORM C

WILDFIRE ACTIVITY REPORT (20 Acres +)

DATE: _____

AGENCY: _____ ADMINISTRATIVE UNIT: _____

BURN NAME: _____ COUNTY: _____

BURN BEGAN: _____ BURN ENDED: _____

TOTAL ACREAGE: _____

FUEL TYPES	PERCENT OF ACTUAL ACREAGE	FUEL LOADING (tons/acre)	PERCENT CONSUMPTION
GRASS			
SAGEBRUSH			
PINYON/JUNIPER			
ASPEN			
PINE/CONIFER			
OTHER			
TOTAL			

SUMMARY OF FIRE ACTIVITY: (Date, Acres Consumed, Impacts on Smoke Sensitive Areas)

Signed: _____ Date: _____
 Name and Title

APPENDIX B

(Pg. 1 of 1)

BURN ACCOMPLISHMENT EVALUATION

1. RESPONSIBLE AGENCY: _____
2. NAME OF CONTACT: _____ PHONE NO. (505) _____
3. DATE OF BURN: _____
4. TIME OF BURN: _____
5. LOCATION: _____

6. NAME OF AIRSHED (See attached map): _____
7. FUEL TYPE, VEGETATIVE TYPE: _____
8. ACREAGE BURNED: _____
9. ESTIMATED TONS BURNED PER ACRE: <3" _____ ; >3" _____
10. DEAD FUEL MOISTURE: 10 HOUR: _____, 100 HOUR: _____
11. FUEL MOISTURE METHOD: NFDRS _____ MEASURED _____
12. DAYS SINCE MEASURABLE RAINFALL/SNOW COVER: _____
13. DESCRIPTION OF SUPPRESSION ACTIVITIES: _____

14. DAYTIME AND DRAINAGE SMOKE BEHAVIOR: _____

15. WAS THE SMOKE MANAGEMENT PRESCRIPTION MET? YES _____ NO _____
16. EMISSION FACTOR (Obtain this from your SASEM run): _____ g/kg.
17. EMISSION RATE (Obtain this from your SASEM run): _____ g/s/m.
18. EMISSIONS: PM-2.5, PM-10, TSP, & VOC's listed in Tables I-IV are estimates using AP-42 factors.

APPENDIX C

(Pg. 1 of 4)

TABLE I
PM-2.5 EMISSIONS

TYPE OF BURN	ACRES	TONS PER ACRE	TOTAL TONS	PM-2.5 LBS./TON	TOTAL LBS. PM-2.5
PILED SLASH.....	_____	x _____	= _____	x <u>8</u>	= _____
BROADCAST SLASH.....	_____	x _____	= _____	x <u>no data</u>	= <u>no data</u>
UNDERBURN (MC).....	_____	x _____	= _____	x <u>no data</u>	= <u>no data</u>
UNDERBURN (PP).....	_____	x _____	= _____	x <u>60</u>	= _____
PINYON/JUNIPER.....	_____	x _____	= _____	x <u>no data</u>	= <u>no data</u>
SAGEBRUSH.....	_____	x _____	= _____	x <u>no data</u>	= <u>no data</u>
BRUSH/OAK.....	_____	x _____	= _____	x <u>no data</u>	= <u>no data</u>
GRASS.....	_____	x _____	= _____	x <u>no data</u>	= <u>no data</u>

13. PM-10 EMISSIONS (Estimates using AP-42 Factors)

TABLE II
PM-10 EMISSIONS

	1	2	3	4	5
TYPE OF BURN	ACRES	TONS PER ACRE	TOTAL TONS	PM-10 LBS./TON	TOTAL LBS. PM-10
PILED SLASH.....	_____	x _____	= _____	x 10	= _____
BROADCAST SLASH.....	_____	x _____	= _____	x 26	= _____
UNDERBURN (MC).....	_____	x _____	= _____	x no data	= no data
UNDERBURN (PP).....	_____	x _____	= _____	x 60	= _____
PINYON/JUNIPER.....	_____	x _____	= _____	x 26	= _____
SAGEBRUSH.....	_____	x _____	= _____	x 18	= _____
BRUSH/OAK.....	_____	x _____	= _____	x 18	= _____
GRASS.....	_____	x _____	= _____	x 20	= _____

14. TSP EMISSIONS (Estimates using AP-42 Factors)

TABLE III
TSP EMISSIONS

TYPE OF BURN	ACRES	TONS PER ACRE	TOTAL TONS	TSP LBS./TON	TOTAL LBS. TSP
PILED SLASH.....	_____	x _____	= _____	x 12	= _____
BROADCAST SLASH....	_____	x _____	= _____	x 34	= _____
UNDERBURN (MC).....	_____	x _____	= _____	x <u>no data</u>	= <u>no data</u>
UNDERBURN (PP).....	_____	x _____	= _____	x 70	= _____
PINYON/JUNIPER.....	_____	x _____	= _____	x 34	= _____
SAGEBRUSH.....	_____	x _____	= _____	x 30	= _____
BRUSH/OAK.....	_____	x _____	= _____	x 30	= _____
GRASS.....	_____	x _____	= _____	x 20	= _____

15. VOC EMISSIONS (Estimates using AP-42 Factors)

TABLE IV
VOLATILE ORGANIC COMPOUNDS

TYPE OF BURN	METHANE			NONMETHANE		
	TOTAL TONS FROM COL. 3 TABLE II	LBS. PER TON METHANE	TOTAL LBS. METHANE	TOTAL TONS FROM COL. 3 TABLE II	LBS. PER TON NON-METHANE	TOTAL LBS. NON-METHANE
PILED SLASH.....	x	2.0	=	x	no data	= no data
BROADCAST SLASH.....	x	3.0	=	x	3.4	=
UNDERBURN (MC).....	x	no data	= no data	x	no data	= no data
UNDERBURN (PP).....	x	no data	= no data	x	no data	= no data
PINYON/JUNIPER.....	x	no data	= no data	x	no data	= no data
SAGEBRUSH.....	x	no data	= no data	x	no data	= no data
BRUSH/OAK.....	x	no data	= no data	x	no data	= no data
GRASS.....	x	no data	= no data	x	no data	= no data

NMED Phone Number: Filiberto D. Dominguez 505-827-1494, Ext. 1507



PERMIT NO. _____
(AQB assigned)

NEW MEXICO ENVIRONMENT DEPARTMENT/AIR QUALITY BUREAU
PERMIT APPLICATION AND REPORTING OF OPEN BURNING FOR
PRESCRIBED/PREScribed NATURAL FIRE AREAS

PERMITTEE: USDA ___ USDI ___ BLM ___ MILITARY ___ DOE ___ PRIVATE ___ OTHER ___

ADMINISTRATIVE UNIT: _____ COUNTY: _____

CONTACT: _____ PHONE: _____

NAME OF BURN: _____ LOCATION: _____

(Township, Range, Section)

PROPOSED ACREAGE _____ FUEL LOADING DETERMINATION METHOD _____

TYPE OF FUEL _____ TONS/ACRE _____

Is burn likely to impact a smoke sensitive area? Yes ___ No ___

If yes, please attach a map of smoke sensitive areas (Include distance and direction).

Smoke sensitive areas include: Class I areas as well as other scenic and important views, urban and rural population centers, hospitals, nursing homes, schools, transportation facilities such as roads, highways, and airports, recreational areas, and other locations that may be sensitive to smoke impacts for health, safety, and/or aesthetic reasons.

Signed _____ Date _____
Name and Title

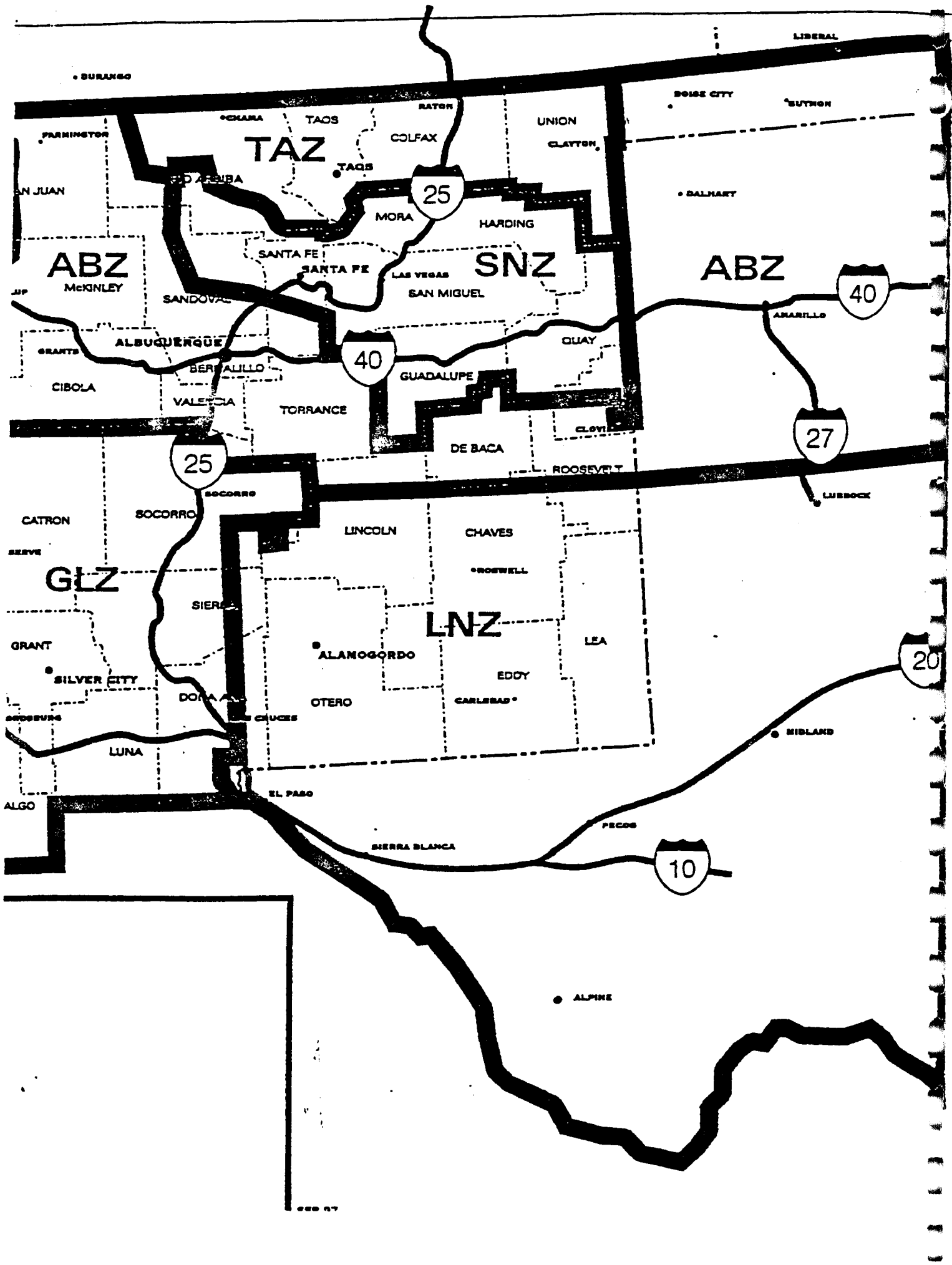
Submit to: New Mexico Environment Department, Air Quality Bureau
2048 Galisteo
Santa Fe, NM 87505

This application has been received by the New Mexico Environment Department and is
APPROVED ___ DENIED ___ for the following reasons: _____

This permit is approved for the following dates: _____
and is subject to the conditions set forth in 20 NMAC 2.60 and the following conditions: _____

The Department reserves the right to cancel this permit at any time if the public interest so warrants it. The holder of this permit is therefore cautioned and charged that he/she, and he/she alone, assumes full responsibility to exercise the utmost care and judgement before igniting any prescribed fires. The Environment Department hereby disclaims any and all liability of itself or it's agents that might be incurred by petitioner's acts.

Signed _____ Date _____
Name and Title



BURANGO

LIBERAL

TAZ

25

UNION

BOISE CITY

BUTRON

PARMINGTON

CHARA

TAOS

RATON

COLFAX

SAN JUAN

DOÑA ANA

TAOS

MORA

HARDING

BALHART

ABZ
McKINLEY

SANTA FE
SANTA FE

LAS VEGAS

SNZ

ABZ

40

SANDOVAL

SAN MIGUEL

AMARILLO

GRANTS

ALBUQUERQUE

40

QUAY

CIBOLA

BERNALILLO

GUADALUPE

VALENCIA

TORRANCE

DE BACA

CLOVIS

27

25

ROOSEVELT

LUBBOCK

CATRON

SOCORRO

LINCOLN

CHAVES

GLZ

LNZ

20

SIERRA

ROSWELL

GRANT

ALANOGORDO

LEA

SILVER CITY

DOÑA ANA

OTERO

EDDY

DOUGLASS

DOÑA ANA

CHUCOS

CARLEBAS

MIDLAND

LUNA

EL PARO

10

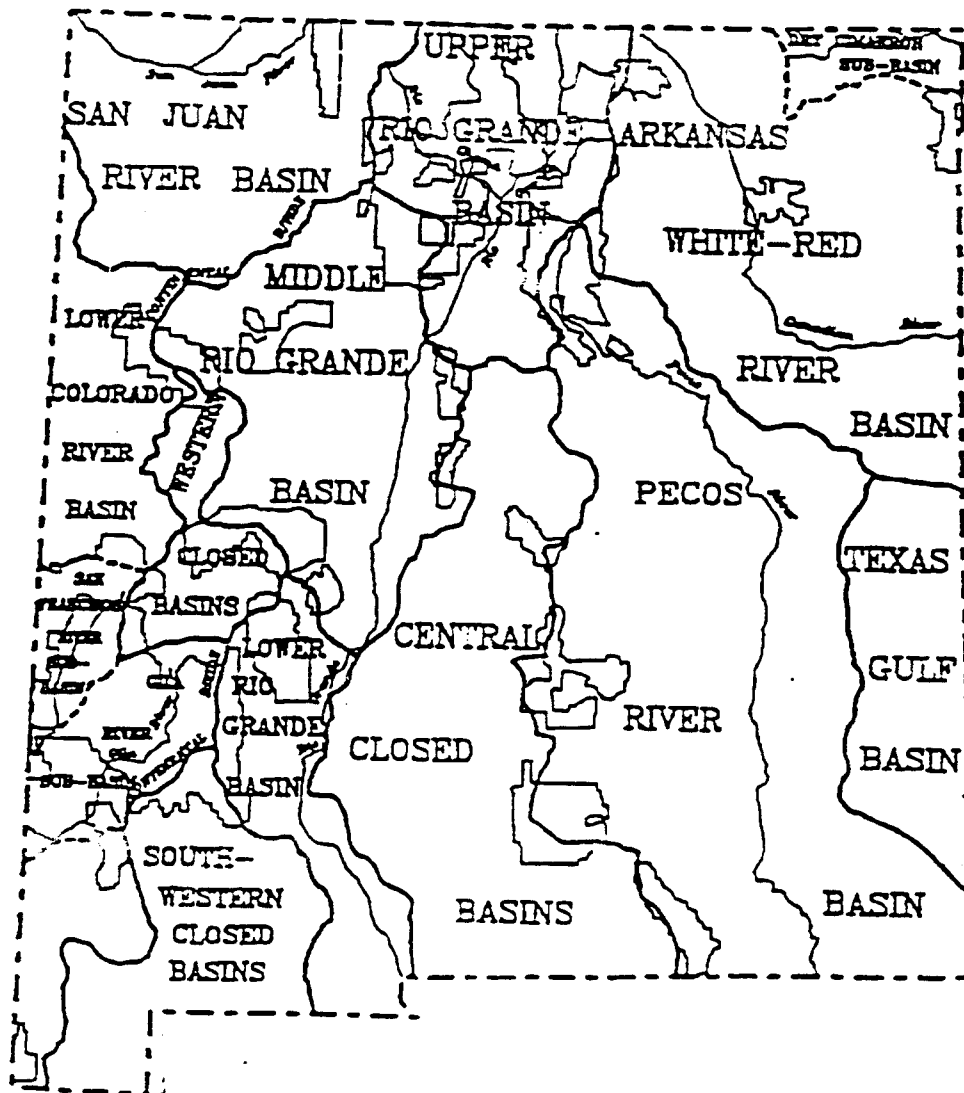
SIERRA BLANCA

PECOS

ALGO

ALPINE

Airsheds in New Mexico based on watershed boundaries.
Produced after New Mexico Water Quality Control Commission, 1990,
"Water Quality and Water Pollution Control in New Mexico."



5. Initial Attack Operating Plan, Santa Fe Zone

^x See the following pages.

INITIAL ATTACK OPERATING PLAN

This operating plan is between the United States Department of Interior; U.S. Fish and Wildlife Service (USF&WS), National Park Service (NPS), Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), the United States Department of Agriculture - U.S. Forest Service (USFS); and the State of New Mexico; Energy, Minerals and Natural Resources Department's Forestry and Resources Conservation Division (F&RCD).

I. AUTHORITY

Authority for this Operating Plan is derived from and part of the 1978 Joint Powers Agreement, Section E., General Provisions, Item 5, among the above mentioned Federal and State agencies, which calls for the preparation and adoption of an annual Operating Plan.

II. PURPOSE

The purpose of this Operating Plan is to establish an agreement among the above mentioned Federal and State agencies for wildland fire initial attack procedures for the area known as the Santa Fe Unit, State of New Mexico.

III. RESPONSIBILITY

It is mutually agreed that each party of this Operating Plan will independently perform initial attack services as defined in Section IV below within those zones for which they have assumed that

responsibility. Such initial attack action shall continue until the fire is either declared out or until it escapes initial attack. If for any reason the Initial Attack Agency cannot perform those initial attack services, the Parent Agency shall be notified as soon as possible.

It also is mutually agreed that each party of this Operating Plan will retain ultimate responsibility for all fire suppression action on lands under its administrative jurisdiction.

IV. DEFINITIONS

A. Escaped Fire is a fire that exceeds the capabilities of the initial response forces.

B. Initial Attack is that initial suppression response to a wildland fire.

C. [Initial Attack Agency is that agency which has the closest and most available fire protection resources for a designated geographical area].

D. Initial Attack Zones are mutually agreed upon geographic areas where initial attack responsibilities have been delineated and agreed upon by parties to this Operating Plan..

E. Incident Commander is the first fire qualified supervisory person to arrive at the fire, until relieved.

F. Notification of Initial Attack Action is documentation, between the initial attack agency and the parent agency, of dispatch action taken following the report of a fire.

G. Parent Agency is that agency having ultimate responsibility for fire suppression action on lands under its jurisdiction.

V. DESIGNATED ZONES OF RESPONSIBILITY

A. Initial Attack Zones have been established based on closest and available fire protection resources, and capabilities of the designated Initial Attack Agency. A map of these zones is attached hereto and made a part of this Operating Plan (Exhibit 1).

The designated Initial Attack Zones are based on historical wildfire incidents and are agreed to by off-setting for Federal and non-federal expenditures of funds, and thereby mutually beneficial and cost effective. Also, it is agreed that Federal protection (cost) on non-federal lands will not exceed the protection by the State. Conversely, the State will not expend funds to a greater extent in protecting Federal lands than would the Federal agencies in protecting Federal lands.

B. The agency responsible for initial attack should make reasonable effort to contact private landowners in advance of fire season. The objective of such contacts is to briefly explain the initial attack responsibilities and obtain keys or permission by the landowner to cut fences or gates for access to fires. Any damage to private lands for access should be restored following control of the fire. These contacts should be made by local unit personnel who have the initial attack responsibility.

VI. SPECIFIC PROVISIONS

A. Initial Attack Fires

1. Communication. Each agency will submit an initial report to cooperating agencies of their available resources by May 1 each year. This report shall be updated as changes occur.

a. Prompt notification to the Parent Agency as soon as is practical after the initial dispatch.

b. The Notification of Initial Attack Action Report will be communicated to Parent Agency within 24 hours of the initial dispatch. See Exhibit II for outline.

c. Authorization has been given between agencies to exchange radios and radio frequencies for fire suppression activities.

2. Coordination

a. Initial Attack Agency shall abide by parent agencies procedures in dealing with ownerships involved.

b. The Initial Attack Agency will continue dispatching services for which initial attack actions are being undertaken.

c. Payment. The Initial Attack Agency will bear the initial attack cost unless otherwise negotiated.

d. Coordination. A Multiple Agency Coordination (MAC) group will be established when such situations arise.

B. Escaped Initial Attack Fire

1. Communication

a. The initial attack Incident Commander shall notify the dispatcher when the fire has escaped initial attack.

b. The time of escape, date, from whom, and to whom the report is made must be documented by the dispatcher, which must be reported immediately to the Parent Agency. See sample (Exhibit III).

c. In situations where the Parent Agency requests the Initial Attack Agency continue suppression actions a Incident Status Summary (ICS-209) must be submitted daily to the Parent Agency. See sample (Exhibit IV).

2. Coordination

a. Parent Agency will assume suppression responsibility for the fire upon notification.

b. As appropriate, suppression plans shall be negotiated and agreed to by coordinating agencies.

c. The need for a Resource Advisor will be determined at the time the Parent Agency is notified of the escaped fire.

d. Dispatch. Agencies involved will negotiate and agree who will have the dispatching assignment.

3. Payment

a. Upon notification of an escaped fire, the

Parent Agency assumes fiscal responsibility as per Section B, C, and D, Item 1d of the Joint Powers Agreement.

b. Fires that are entirely on lands under State jurisdiction: Upon notification of an escaped fire, the State will designate a comptroller or authorized individual to approve expenditures and fiscal responsibilities.

c. Initial attack agency shall submit an estimate of reimbursable suppression cost for fires on State and private lands to the Forestry and Resources Conservation Division within 2 weeks from the time that the service was rendered. See Exhibit V.

VII. GENERAL PROVISIONS

A. News Releases. Involved agencies will coordinate news release items pertaining to the current fire situation to the media.

B. Mop Up and Abandonment Checks. The Initial Attack Agency will be responsible for mop up and abandonment checks, unless otherwise negotiated.

C. Fire Statistics (Fire Report, Records, etc.)

1. The origin of the fire denotes the Parent Agency.

2. The Parent Agency has the responsibility of preparing their statistical fire report. Information for this report shall be provided by the Initial Attack Agency.

D. Effective Date. This plan is effective when all parties have signed this plan.

E. Review and Revisions

1. This plan will be reviewed annually before March 15 of each year.

2. This plan will remain in effect among all the signing parties until one or more of the parties submits a written notice of withdrawal from the plan or requests a change in the plan which would affect the other parties signing the plan. Interim modifications of this plan may be made subject to agreement by parties concerned to correct unworkable situations.

3. Changes in initial attack jurisdictional areas will be made as attachments to this plan and will be signed only by those parties involved in the jurisdictional changes. Amendments will be submitted to the Forestry and Resources Conservation Division to be placed in the Joint Powers Operating Plan master file.

4. Copies of the master Joint Powers Operating Plans and maps of initial attack zones will be maintained by the Forestry and Resources Conservation Division.

AMENDMENT 1

As per Section VII., Paragraph E., Item 3., of the Initial Attack Operating Plan for the Santa Fe Unit, the Santa Fe National Forest and the Energy, Minerals and Natural Resource Department's Forestry and Resources Conservation Division hereby enter into the following agreement for initial attack on Santa Fe National Forest lands North and West of Las Vegas, New Mexico as follows:

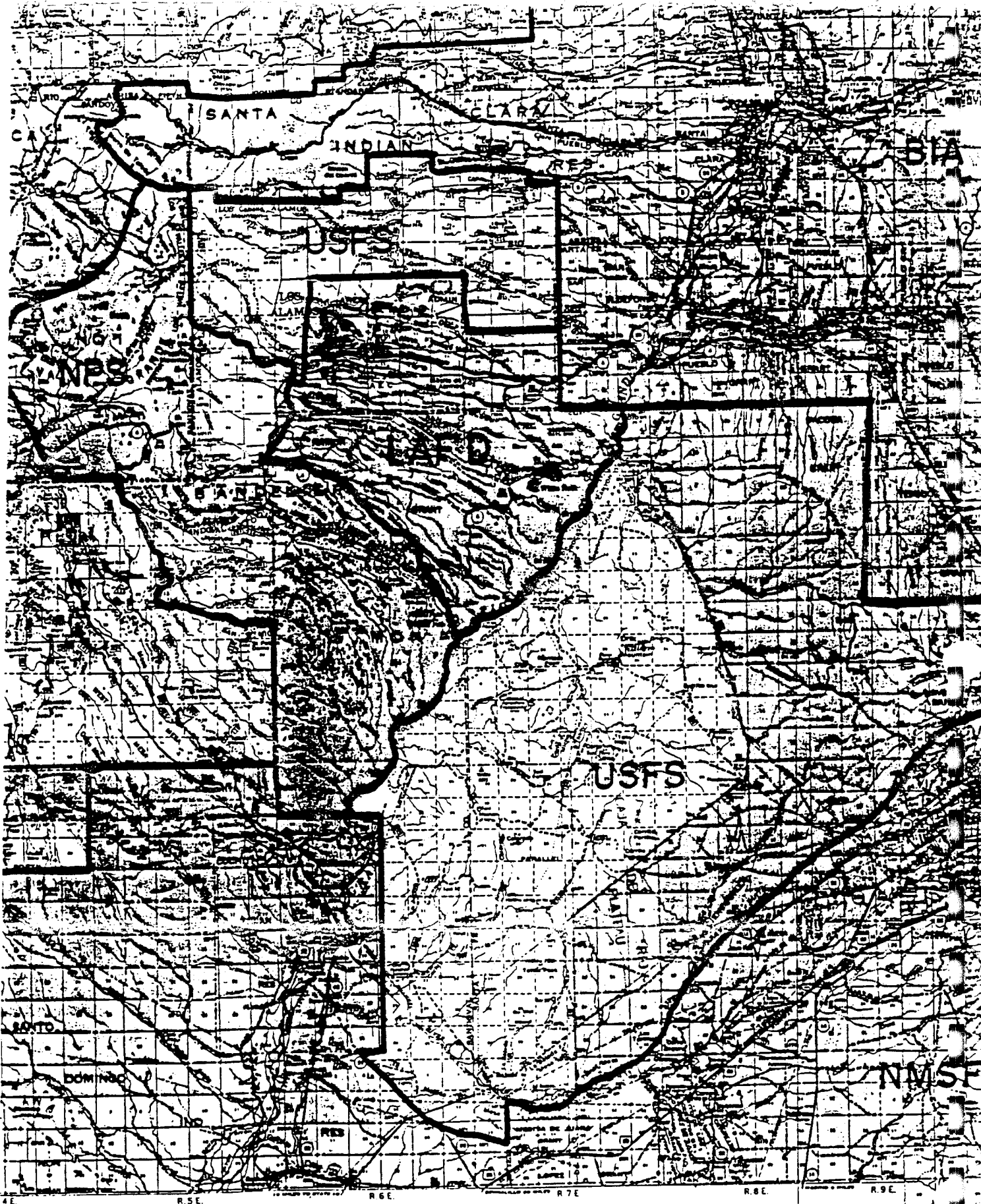
Santa Fe National Forest

The Santa Fe National Forest will provide two trained seasonal GS-3 or GS-4 firefighters to assist the Las Vegas District of the Forest and Resources Conservation Division in staff on engines at the Las Vegas District headquarters for a minimum time period of May 1 - July 31. The Forest Service shall be responsible for hiring, time reporting, and all other personnel actions necessary for the employment of these persons.

Forestry and Resources Conservation Division

The Forestry and Resources Conservation Division's Las Vegas District will prepare fire time reports for all fire suppression time and submit it to the Pecos Ranger District at the end of each payperiod.

All salary costs incurred by these two individuals on fires for which the Forestry and Resources Conservation Division has fiscal responsibility will be paid by the Forestry and Resources Conservation Division as a reimbursable suppression cost.



4E R.5E. R.6E. R.7E. R.8E. 114N

6. Southwest Area Preparedness Levels

See the following pages.

Southwest Area Mobilization Guide
Section 27 • Preparedness Levels

27.1 Southwest Area Preparedness Level Overview

a. **Purpose.** All wildland protection agencies are directed to protect life, property, and the natural resources entrusted to them. These requirements dictate strict attention be paid to the availability and use of suppression resources. To this end, a system has been established to determine the preparedness levels that all wildland fire agencies within the Southwest Area will use. These preparedness levels will provide for presuppression and suppression capabilities suited to fire hazard, risk, and the overall situation complexity.

This plan will serve three primary functions:

1. To coordinate workforce and equipment needs for prescribed fire and wildfire suppression needs.
2. To insure that prescribed fire use and fire protection responsibilities do not exceed area wildland fire management capabilities and that such use is coordinated with area and national suppression needs.
3. To insure prescribed fire activities do not violate air quality constraints.

Preparedness levels are basically dictated by:

1. Condition of the fuels protected.
2. Resultant burning characteristics.
3. Fire activity, prescribed and wildland, both within and outside of the Southwest Area.
4. Resource availability, within and outside of the Southwest Area.
5. Air quality considerations.

b. **Definitions.**

1. **Severity 5 Day Average.** The energy release component (ERC) derived from the representative fire weather stations through the area averaged over each 5 day period to obtain an areawide average 5 day ERC curve.
2. **Prescribed Fire.** Collective term which includes all preplanned management ignitions (prescribed burns) and prescribed natural fires.

c. **Fire Preparedness Level Determination Procedures.** The Southwest Coordination Center Director will establish the overall planning level for the Southwest Area. The following criteria will be assessed to determine planning levels:

1. Current and long range forecasted weather effecting:
 - a. Current and forecasted fire behaviors/potential.
 - b. Current and trend of 5 day average fire severity for the Southwest Area.
 - c. Comparison of current and trend severities to the seasonal Southwest Area Fire Severity Curve.
 - d. Resource commitments to activities (i.e., Projects, Prescribed Fire, Wildfire).

Southwest Area Mobilization Guide
Section 27 • Preparedness Levels

2. Individual agency fire reports.
 3. National Preparedness Level.
 4. Air quality considerations.
 5. Fire suppression resource availability.
- d. **Using the Plan.** Each preparedness level requires specific actions, assigned to certain Southwest Area positions. When a planning level has been established, the responsible individuals are to carry out their assignments without further notification.
- e. **General Preparedness Level Descriptions.** Five Preparedness Levels are recognized and summarized as follows:
1. **Preparedness Level I.** Optimum conditions for normal prescribed fire operations. Wildfire activity within the Southwest Area is light, and large fires are of short duration. There is little or no commitment of Southwest Area and/or National resources.
 2. **Preparedness Level II.** Zone and Area resources are adequate to manage all wildfires and prescribed fires. Numerous Class A, B, and C fires are occurring and a potential exists for escapes of larger fires for more than one burning period. Potential exists for frequent mobilization of additional resources from other zones.
 3. **Preparedness Level III.** There is a potential for two or more Zones to experience incidents requiring a major commitment of Area/National resources. High potential exists of fires becoming Class D and larger. Zones may be requesting resource priorities from SWCC.
 4. **Preparedness Level IV.** Class D and larger fires are common and have the potential to exhaust Southwest Area and National resources. Competition exists for Area/National resources.
 5. **Preparedness Level V.** Several zones are experiencing major fires, and National resources are exhausted. Military resources have been committed within the Southwest Area.

NOTE: National Preparedness Level requirements may require the Area Preparedness Levels to be raised. (Reference Appendix I)

27.2 Southwest Area Severity Index and Reporting Procedures

The Southwest Area Intelligence Section in SWCC will monitor the predetermined considerations daily. When the window for Preparedness Levels I and II are exceeded, the Intelligence Chief will notify the SWCC Director, who will evaluate the situation and determine, based on written criteria, the appropriate action. In Preparedness Level III, when the preparedness window is exceeded, the SWCC Director will notify the Operations Officer of the situation, and include the report in the Daily Management Briefing. Each member of the Southwest Fire Management Board will personally be advised of the pending situation.

Each Board member will be responsible to coordinate initiating the restrictions imposed by the preparedness level upon the lands within their jurisdiction.

Southwest Area Mobilization Guide
Section 27 • Preparedness Levels

27.3 Southwest Area Preparedness Level Action Plan

27.3.1 PREPAREDNESS LEVEL I

- a. Northern zones have low to moderate fire danger, southern zones may be moderate to high.
- b. SW Area fire severity 5 day mean average consistently below 30.
- c. Fire activity within the Southwest Area is light, and large fires are of short duration; i.e., not more than one burning period or delayed to be in confine/contain mode. There is little or no commitment of Southwest Area and/or National resources.
- d. Five to 10-day weather forecast does not predict a sustained significant increase in fire severity (i.e., Red Flag watches and warnings, frontal passages).
- e. National Preparedness Level is I or II. (See Appendix I)

Responsibility	Action Items
<i>Southwest Fire Management Board</i>	<ol style="list-style-type: none"> 1. Select Type I Incident Management Teams. 2. As needed, review the State Joint Powers agreements. 3. Review SWCC operating plan and delegate authority to the SWCC Director to carry them out. 4. Review and revise the Board operation plan.
<i>SWCC Center Director</i>	<ol style="list-style-type: none"> 1. Review Southwest Interagency Coordination Center operating guide with the SWFMB. 2. Pre-position National Fire Radio Cache systems at Albuquerque and Prescott. 3. Pre-position Air Transportable Mobile Unit (ATMU) in Albuquerque. 4. As needed, assist the SWFMB in the revision of operating plans under the State Joint Powers agreements. 5. Review operating plans for Mobilization Centers in the Southwest Area. 6. Review, revise, and develop memorandums of understanding between the Southwest Area and other areas as needed. 7. Follow up with Zones to assure pre-season agreements are completed, provide assistance where needed. 8. Assure the Southwest Area Operating Plan and Mobilization Guide are complete and updated.

Southwest Area Mobilization Guide
Section 27 • Preparedness Levels

10. Assure flight following practices are followed.
11. Maintain weekly Situation Reports.
12. Develop and Maintain Seasonal Severity Chart.
13. Notify NIFC, Southwest Area Dispatch Zones, and the SWFMB of any major incidents.
14. Participate in zone fire preparedness staff inspections.
15. Monitor resource availability.

Zone Fire Management Boards

1. Select Type II Incident Management Teams.
2. As needed, review operating plans under the State Joint Powers Agreements.
3. Review zone operating plan; delegate authority to the Zone Center Manager to carry it out.

Zone Center Manager

1. Review Zone Coordination Center Operating Plan with the Zone Interagency Fire Management Board.
2. Assist Zone Interagency Fire Management Board in revision of Operating Plan of the State Joint Powers Agreements, as needed.
3. As needed, review operating guides for local Mobilization Centers.
4. As needed, initiate zone Interagency Hotshot Crew and Southwestern Forest Fire Fighter Crew rotation schedules.
5. Develop and maintain seasonal fire severity charts.
6. Assure pre-season agreements are completed, provide assistance where needed.
7. Assure Zone Operating Plan is complete and updated.
8. Keep SWCC informed daily if prescribed fires are planned or occurring, and all resource commitments to these activities.
9. Notify SWCC and other Southwest zones of major incidents via FNET.
10. Assure flight following practices are adhered to.
11. Prioritize fire suppression actions to optimize suppression effectiveness within the Zone by using appropriate strategies.
12. Forward Weekly Situation Reports to SWCC.

Southwest Area Mobilization Guide
Section 27 • Preparedness Levels

27.3.2 PREPAREDNESS LEVEL II

- a. Numerous zones are consistently in high fire danger, southern zones may be higher.
- b. SW Area fire severity 5 day mean average is consistently between 30 and 45.
- c. Numerous Class A, B, and C fires are occurring and a potential exists for larger fires of more than one burning period duration. Resources within the zones are adequate. Potential exists for movement of resources between zones to become more frequent.
- d. National Preparedness Levels between I and IV. (See Appendix I)
- e. Five to 10 day weather forecast does not predict a sustained increase in fire severity (i.e., Red Flag watch and warnings, frontal passages, etc.)

Responsibility	Action Items in addition to Level I
<i>Southwest Fire Management Board</i>	<ol style="list-style-type: none"> 1. Initiate Type I Incident Management Team on-call schedule. 2. Coordinate the issuance of press releases that highlight interagency current conditions and a brief outlook.
<i>SWCC Center Director</i>	<ol style="list-style-type: none"> 1. Activate 7 day operation for SWCC. 2. Expand SWCC operations to provide proper staffing of the Resource and Intelligence desks to cover 13 to 16 hour coverage. 3. Activate presuppression lead plane agreements. 4. Initiate submission of zone daily situation report (wildfire and prescribed fire). 5. Compile and submit SW Area daily SITSTAT and RESTAT report to NICC and SW Area zones. 6. Compile and distribute daily resource availability within the Southwest Area. 7. Contact National Weather Service Offices to activate twice-daily Fire Weather Forecasts.
<i>Intelligence Chief</i>	<ol style="list-style-type: none"> 1. Prepare and disseminate morning briefing report.
<i>Zone Fire Management Boards</i>	<ol style="list-style-type: none"> 1. Initiate Type II Incident Management Team on-call schedule. 2. Consider activating an Intelligence specialist(s) for zone activities. 3. Coordinate the issuance of press releases that highlight current interagency conditions and a brief outlook.

Southwest Area Mobilization Guide
Section 27 • Preparedness Levels

Zone Center Manager

1. Activate 7 day operation of the Zone as requested by the Center Director.
2. Expand Zone Coordination Center operations to provide proper staffing as needed.
3. Assure management systems provide sufficient support to keep computers and telecommunications fully operational.
4. Compile and submit zone daily situation report to SWCC.
5. Initiate conference calls to members of the Zone Management Board to discuss the situation. Frequency of conference calls and/or meetings to be determined by the Board.
6. Monitor Area Severity Index with increased attention in an upward trend.

27.3.3 PREPAREDNESS LEVEL III

- a. Most Zones experiencing high or greater fire danger.
- b. SW Area fire severity 5 day mean average is consistently between 46 and 59.
- c. High potential exists of fires becoming class D and larger. Incidents are requiring a major commitment of Southwest Area or National resources. Mobilization of additional resources are being ordered through SWCC; competition exists for resources between zones.
- d. National Preparedness Level from I-IV. (See Appendix I)

Responsibility	Action Items in addition to Level I & II:
<i>Southwest Fire Management Board</i>	<ol style="list-style-type: none"> 1. Establish interagency public information specialist(s) for SWCC on 24 hour basis as needed. 2. Initiate requests for severity funds. 3. Consider activation of MAC Group.

SWCC Center Director

1. Operate SW Area Coordination Center on a 24 hour basis as needed.
2. As needed, require OVERSTAT to be updated twice daily.
3. Prioritize fire suppression actions to optimize suppression effectiveness by using appropriate logistical strategies.
4. Assure management systems provide sufficient support to keep computers and telecommunications fully operational.

Southwest Area Mobilization Guide
Section 27 • Preparedness Levels

5. Monitor the implementation of fire restrictions throughout the Southwest Area.
6. Initiate conference calls to members of the SWFMB to discuss the current situations. Frequency of conference calls and/or meetings to be determined by the Group.
7. Maintain one-half of contract helicopters within the Southwest Area for initial attack.
8. Maintain four air tankers within the Southwest Area for initial attack.
9. Maintain two hotshot crews per state for new start support.
10. Activate a Fire Behavior Center in SWCC as needed, based upon need and severity.
11. Coordinate fire restrictions.
12. Coordinate teleconference with all Zone Center Managers.

Intelligence Chief

1. Present morning briefing as directed by Center Director.

Zone Fire Management Board

1. Initiate request for severity funds.
2. Consider implementation of fire restrictions within the zone.

Zone Center Manager

1. As needed, operate Zone Coordination Center on a 24 hour basis.
2. Keep OVERSTAT updated continuously.
3. Through Zone Management Board monitor the implementation of fire restrictions.
4. Prepare Daily Morning Management Briefing paper.

27.3.4 PREPAREDNESS LEVEL IV

- a. Numerous zones are experiencing very high or greater fire danger.
- b. SW Area fire severity 5 day mean average is consistently between 60 and 78.
- c. Class D and larger fires are common. The potential exists to exhaust Area/National Resources.
- d. National Preparedness Levels I-V. (See Appendix I)
- e. Numerous periods of severe air stagnation are occurring in sensitive airsheds.

Southwest Area Mobilization Guide
Section 27 • Preparedness Levels

Responsibility	Action Items in addition to Level I - III
Southwest Fire Management Board	<ol style="list-style-type: none"> 1. Notify NICC and all SW Area zones of MAC Group members, telephone numbers. 2. Prioritize fire suppression actions to optimize suppression effectiveness within the SW Area. 3. Coordinate with agency heads to suspend Ignition of prescribed burns and declaration of Prescribed Natural Fires, except those that are of no significance or risk. Coordinate suspension of prescribed fire activities with the Zone Boards.
SWCC Center Director	<ol style="list-style-type: none"> 1. Request SWFMB activate the MAC when multi-agency fire problems exist. 2. Notify NIFC and all SWA Zones when MAC Group is operational. 3. Pre-position additional initial attack resources in strategic locations. 4. Coordinate resource needs with SWFMB/MAC. 5. Coordinate interagency need for specific area closures.
Zone Fire Management Board	<ol style="list-style-type: none"> 1. Coordinate with agency heads the SWFMB direction to suspend or curtail ignition of prescribed burns. 2. Determine interagency need for area closures. 3. Limit prescribed burns and prescribed natural fires to those certified by the agency administrator to have little chance of requiring suppression resources beyond those committed in the prescribed fire plan. This determination shall be made daily, in writing, and shall become a permanent part of the prescribed fire situation analysis. All new natural ignitions will be classified as wildfires and appropriate suppression action taken, except when approved by a Southwest Area agency head. 4. Coordinate prescribed fire activity suspensions.

27.3.5 PREPAREDNESS LEVEL V.

- a. Same as Level IV with addition of military resources.

Responsibility	Action Items in addition to Level I - IV
Southwest Fire Management Board	<ol style="list-style-type: none"> 1. Add Military Liaison to MAC Group if not already in place.

Southwest Area Mobilization Guide
Section 27 • Preparedness Levels

APPENDIX I

1. The following comparison chart will be used to assist the Southwest Area Coordinator in determining the SW Area preparedness levels based upon the National situation.

SOUTHWEST AREA LEVELS

		I	II	III	IV	V
N A T , L	I	I	II	III	IV	V
	II	I	II	III	IV	V
	III	II/III	II/III	III	IV	V
	IV	II/IV	II/IV	III/IV	IV	V
	V	III/IV	III/IV	III/IV	IV/V	V

AN ENVIRONMENTAL ASSESSMENT FOR
THE FIRE MANAGEMENT PLAN
BANDELIER NATIONAL MONUMENT
NEW MEXICO

National Park Service
U.S. Department of the Interior

G. Environmental Assessment, Fire Management Plan

See the following pages.

TABLE OF CONTENTS

PURPOSE OF AND NEED FOR PROPOSED ACTION	1
Objectives and Constraints	1
Action Objectives	2
Action Constraints	2
Primary Decision to be Made	2
PROPOSED ACTION AND ALTERNATIVES	3
A. No Action: Continue Current Program of Limited Management-Ignited Prescribed Fires according to the Fire Management Plan approved in 1987	3
B. Expand Management-Ignited Prescribed Fire Program and Implement A Prescribed Natural Fire Program Under Revised Fire Management Plan (Proposed Action)	3
C. Mechanical Reduction of Hazard Fuels in the Piñon-Juniper Woodland and Mixed Conifer	5
AFFECTED ENVIRONMENT	7
ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES	11
Impacts to Cultural Resources	12
Impacts to Air Quality and Related Values	13
Impacts to Water Quality and Soils	14
Impacts to Threatened and Endangered Species	15
Impacts to Other Plants and Animals	17
Impacts to Wetlands/Riparian Zones and Floodplains	18
Impacts to Wilderness and Scenic Values	20
CONSULTATION AND COORDINATION	23
Distribution List	23
Governing Entities	23
Other Agencies or Organizations	24
Individuals Who Have Expressed Interest:	25
PREPARER/REVIEWERS	27
REFERENCES CITED	29
GLOSSARY	31
APPENDIX A. Ten-Year Prescribed Fire Schedule	A-1

APPENDIX B. Applicable Laws and Regulations	B-1
Federal Laws	B-1
Executive Orders	B-3
National Park Service Policies	B-3
APPENDIX C. Resource Management Goals and Objectives	C-1
APPENDIX D. Management Ignited Prescribed Fire Unit Map	D-1
APPENDIX E. Fire Management Zone Map	E-1

PURPOSE OF AND NEED FOR PROPOSED ACTION

The National Park Service (NPS) recognizes the crucial role naturally occurring fire plays in many fire-adapted plant communities (NPS 1988). Most plant communities in Bandelier are fire-adapted and fire-dependent, a fact that has been determined through extensive scientific studies (Allen 1989; Caprio, *et al.* 1988, Swetnam 1990; Touchan and Swetnam 1992). Prior to the 1890s, the mean fire return interval for the upper Frijoles watershed ranged from 2.4 to 22.9 years. The average fire frequency for all sampled areas (ponderosa pine-mixed conifer overstory) is one fire in 10 years during the 18th and 19th centuries (Allen 1989). This fire frequency was severely altered beginning in the latter half of the 19th century as a result of human-induced changes to the landscape, particularly large-scale domestic livestock grazing and routine fire suppression. As a result of Euro-American land management practices such as these, the structure and species composition of these fire-adapted vegetative communities has changed dramatically. An unfortunate consequence of this dynamic has been the high-intensity crownfire. In 1977 the La Mesa fire and the 1996 Dome fire displayed patterns of fire behavior inconsistent with most historical fires of lower intensity within this cover type.

Objectives and Constraints

Management of Bandelier's cultural and natural resources is directed by laws, regulations and policies which mandate preservation of these resources. The Bandelier Resource Management Plan (NPS 1994) further defines specific objectives (See Appendix C for text).

The scope of the proposed action and alternatives is to begin to restore the park's ecosystem processes to levels which existed before the settlement of Euro-Americans in the area. Hence, the goal of fire management at Bandelier is to ultimately support naturally-occurring fires (i.e., prescribed natural fires) in areas where relatively "natural" conditions exist, and in such a manner where adjacent ownerships are not adversely affected. The initial phase for the prescribed natural fire program (PNF) involves much of the Bandelier wilderness (Map, Appendix E). Within this designated area, much of the fuel accumulations (ie, debris) have been reduced from combinations of management-ignited prescribed fire and recent [Dome] wildfire. Therefore, it is anticipated that most declared PNF incidents will be of low to moderate intensity for several years to come.

Action Objectives

Bandelier National Monument has defined four objectives in this proposal that are supported by Federal law, NPS policies and Bandelier's resource management goals and objectives. The actions needed to meet mandates and park objectives are to:

1. Allow prescribed natural fires to function in fire-dependent ecosystems, to the extent possible.
2. Use fire (i.e., management-ignited prescribed fire) to meet specific management objectives.
3. Protect life, property, and park resources from the undesirable effects of fire.
4. Prevent adverse impacts from fire suppression.

Action Constraints

1. Chemical retardants will not be routinely used. However, when authorized by the Superintendent, only fugitive dye-type retardant will be allowed.
2. Dozers are prohibited within the monument.
3. Sensitive areas or species (particularly threatened, endangered or candidate) in the park will be protected.

Primary Decision to be Made

The purpose of this environmental assessment is to explore alternatives towards accomplishment of the stated objectives, within the defined constraints, listed above.

PROPOSED ACTION AND ALTERNATIVES

A. No Action: Continue Current Program of Limited Management-Ignited Prescribed Fires according to the Fire Management Plan approved in 1987

Under a "No Action" alternative, existing conditions and management practices would continue. Approximately 12 to 81 hectares (30-200 ac) would be treated through management ignited prescribed fire each year. The guiding document will continue to be the Bandelier's Fire Management Plan (NPS 1985). However, prescribed natural fires would not be allowed to continue although they are permitted under the 1987 Plan.

All prescribed fires would be ignited under site-specific objectives, prescriptions and mitigating measures identified in individual prescribed burn plans which are approved annually. Fire effects would be monitored through occasional use of downed fuel inventory transects and photo points.

Management activities surrounding the prescribed fire program, including objectives setting, preparation and study would be accomplished through the existing Fire Management Plan. Completion of compliance documents and mitigation is specified in each prescribed burn plan.

B. Expand Management-Ignited Prescribed Fire Program and Implement A Prescribed Natural Fire Program Under Revised Fire Management Plan (Proposed Action)

Under this alternative, expanded management-ignited prescribed fires (MIPF) would be used as a management tool along with prescribed natural fire to restore and/or maintain fire dependent ecosystems.

Prescribed fires would be conducted according to a Ten-Year Burn Schedule (Appendix A). This schedule is designed to allow for treatment of unnaturally high and potentially hazardous accumulations of fuels and to restore the role of fire within these fire-dependent vegetative communities. The number of hectares to be treated by MIPF will be increased to approximately 300 to 600 hectares (800-1500 ac) annually, depending upon conditions.

Due to the longterm absence of fire as a regulator of stand density in the montane grasslands areas, mechanical tree thinning becomes the management treatment of

choice. These grasslands, which occur at the higher reaches of the Frijoles drainage, were established and maintained through (1) periodic fire; (2) animal grazing activity; (3) southerly exposure; (4) soil drought due to wind blown transfer of winter snows creating xeric conditions favoring grasses; (5) deep "A" horizon soils typical of grasslands; and (6) grassland competition against tree seedling establishment (Allen 1989). Samples from hundreds of tree cores indicate that tree invasion began in the late 1910's and continued through present. These invading trees are largely not affected by prescribed burning on the higher ridges; therefore felling with saws becomes an effective technique to maintain the historically open and widely-spaced character of the tree cover. Selective prescribed burning can then be employed as a followup to consume the downed trees.

All management-ignited prescribed fires will comply with NPS policies and guidelines, and relevant laws and regulations. An annual permit will be requested for all planned ignitions to the State of New Mexico Environmental Improvement Division, Air Quality Bureau in compliance with the Memorandum of Understanding for New Mexico Smoke Management (rev 1997).

All planned prescribed fire units will be subject to a cultural resource clearance pursuant to the National Historic Preservation Act of 1966, and guidelines set forth by the New Mexico State Historic Preservation Officer through the Programmatic Memorandum of Agreement. A qualified archaeologist will survey of the proposed unit, and will identify and document any mitigating actions required. This activity is in accordance with Section 106, National Historic Preservation Act. Criteria applied to determine adverse effect include, but are not limited to: (1) destruction or alteration; (2) isolation from or alteration of the site's surrounding environment; and (3) introduction of noncharacteristic elements. Of particular concern are standing architecture and/or datable wood. Any sites or other features deemed to be in any way potentially adversely affected will be fully mitigated to standards set forth by the archaeologist. Mitigating actions may include, but are not limited to: removal of logs or debris from in or around sites; protection of any sites by isolating them from the fire, or temporarily removing materials under supervision of an archaeologist.

With respect to MIPF within Mexican spotted owl habitat, Bandelier will exclude this activity until such time as a biological opinion is issued by the U.S. Fish and Wildlife Service. The monument will observe guidelines identified in the "Recovery Plan" for spotted owls until further notice.

All constructed firelines will be rehabilitated and all equipment and debris associated with the prescribed fire will be removed within three weeks following each project. The public will be notified of all prescribed fires within one week of a planned ignition date.

Prescribed natural fire (PNF) is proposed as the strategy of choice for natural ignitions over that portion of the Bandelier Wilderness south of the south rim of Frijoles Canyon (see map, Appendix E). "Prescribed Natural Fire (or PNF)" is defined as:

A fire ignited by natural means (usually lightning) which is permitted to burn under specific prescribed conditions, in a preplanned location, and with adequate fire management personnel and equipment available to achieve defined resource management objectives.

All declared PNF's will be carefully monitored and documented. Sources of ignition will also be verified and documented for each.

Most of the proposed PNF area has been surveyed for cultural resources, particularly much of the area of the 1996 Dome fire. However, should one occur in an as yet unsurveyed location, an archaeologist (also fire certified) will be dispatched immediately to provide on-site reconnaissance of the area. Any objects which could potentially be affected will be protected under established guidelines in the Fire Management Plan. However, it is not anticipated that fuel loadings in the entire zone will reach a level of intensity to be of concern. Approved PNF prescriptions will provide additional constraints on burn intensities. The environmental effects of this management strategy will also be monitored according to strict guidelines and standards outlined in the Fire Monitoring Handbook (NPS 1992).

The unmitigatable impacts of the proposed action are: decreased visibility and increased levels of particulates that will occur on a short-term basis from management-ignited prescribed fires; some areas will be blackened for short periods (i.e., a season); some tree trunks will be blackened by char and foliage will be browned by scorching; some animals will be injured or killed as a result of fire and tree mortality; and visitor access will be restricted for short periods from burn areas during actual ignitions. For PNF, visibility may be impaired over portions of the Bandelier wilderness by varying levels of smoke. However, impacts will be intermittent. Otherwise, impacts from MIPF discussed above would likewise apply to PNF activity.

C. Mechanical Reduction of Hazard Fuels in the Piñon-Juniper Woodland and Mixed Conifer

Under this alternative, woody surface debris (i.e., logs, branches, etc) would be manually removed from areas where high wood concentrations exist, thus reducing the potential for high intensity wildfires.

Much of the work required in the piñon-juniper woodland is within designated wilderness, subject to severe minimum-tool constraints. Vehicular access to project areas would be non-existent or extremely limited, via wilderness and backcountry management policies.

AFFECTED ENVIRONMENT

Bandelier is located on the southern portion of the Pajarito Plateau in the Jemez Mountains at the southern edge of the Rocky Mountains in north central New Mexico (see Figure 1). The area is composed of volcanic ash deposits and lava flows that have been eroded into deep canyons. The park comprises 13,091 hectares (32,727 ac) and extends from the Rio Grande at 1,615m (5,300 ft) to the summit of Cerro Grande at 3,109 m (10,199 ft) on the Jemez Caldera rim. The park's landforms and vegetation have been subjected to a variety of significant human influences, particularly grazing and fire suppression (Allen 1989).

The significance of Bandelier lies in its superb combination of cultural, natural, and wilderness values. To recognize these wilderness values, President Ford signed legislation in October, 1976, creating a 9,423 hectares (23,267 ac) Bandelier Wilderness (P.L. 94-567). Ninety percent of the park is managed as backcountry and more than half of its trails (Frijoles Canyon and Bandelier Backcountry) are part of the National Trail System.

Native Americans have lived in the region for at least the past 10,000 years. The ruins noted in the enabling legislation were occupied by the ancestral Puebloan People between 1100 and 1600 A.D. The full extent of the park's archeological resources is unknown. However, Head (1992) reports that the Bandelier Archeological Survey of 1987-91 inventoried 43 percent of the park, recording 1,959 sites with an overall density of one site per 2.7 hectares (6.8 ac). Such an abundance of archeological sites clearly indicates that, the park contains excellent resources for research into the lifestyle of the ancestral Puebloan People.

Figure 1 - Vicinity Map

The major vegetation communities encountered in the elevations between the Rio Grande and the eastern rim of the Valles Caldera may be summarized as follows:

- juniper (Juniperus monosperma) grasslands from about 1600-1900 m (5,249-6,234 ft);
- piñon-juniper (Pinus edulis) woodlands at 1900-2100 m (6,234-6,889 ft);
- ponderosa pine (Pinus ponderosa) forest at 2100-2300 m (6,889-7,546 ft);
- mixed conifer forest consisting of ponderosa pine, Douglas-fir (Pseudotsuga menziesii), white fir (Abies concolor), aspen (Populus tremuloides), and limber pine (Pinus flexilis) at 2300-2900 m (7,546-9,514 ft);
- spruce-fir forest of Engelmann spruce (Picea engelmannii) and corkbark fir (Abies lasiocarpa var. arizonica) on the north slopes of the highest peaks above 2900 m (9,514 ft).

High elevation grasslands (Festuca thurberi, Danthonia parryi) occur as large breaks in mixed conifer forests on upper south-facing slopes, and large moist meadows occupy the caldera basins. The vascular plant flora of Bandelier National Monument includes collections of 720 species in 347 genera representing 86 families. Rare and endangered plant species found locally include the yellow ladyslipper (Cypripedium calceolus), rattlesnake fern (Botrychium virginianum) and grammagrass cactus (Pediocactus pappacanthus).

The monument is bordered to the south, west and northeast by the Santa Fe National Forest; to the north by a private 36,00 hectares (90,000 ac) ranch (Baca Land and Cattle Company; also a registered National Natural Landmark known as "Valles Caldera"); and to the east by Department of Energy (Los Alamos National Laboratory) lands (see Fig. 1). The park is a member of the Joint Powers Operating Plan, Santa Fe Zone. This interagency cooperative plan provides for mutual aid initial attack of wildfires using the concept of closest available resources.

The communities of Los Alamos and White Rock are about five air miles to the east and southeast, respectively, from the park. The population of these two areas exceeds 17,000. These communities are composed of a high proportion of well-educated individuals who are employed by the Los Alamos National Laboratory. Consequently, the economies of the two towns are almost entirely dependent on the Laboratory.

ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND ALTERNATIVES

Environmental issues associated with the proposed action and/or the other alternatives are marked in the table below.

CRITICAL ELEMENTS	AFFECTED	
	Yes	No
Cultural Resources	X	
Air Quality & Related Values	X	
Water Quality & Soils	X	
Threatened/Endangered Species	X	
Other Plants & Animals	X	
Wetlands/Riparian Zones & Floodplains	X	
Wilderness and Scenic Values	X	

Impacts to Cultural Resources

No Action (Continue Current Program of Limited Management-Ignited Prescribed Fire according to the Fire Management Plan approved in 1987)

Under the limited prescribed burn alternative, mitigation and compliance measures to protect all cultural resources will remain. However, with the potential of increased suppression actions the adverse impacts to these resources would likely increase. Impacts may include damage or displacement of cultural materials, resulting from fireline construction and mop up activities, as well as direct effects of heat on materials in some cases.

Resource advisors assigned to the suppression organization would be required to provide guidance in mitigation measures and ensure that the constraints listed by the Superintendent are being followed by the incident commander and staff.

Expand Management-Ignited Prescribed Fire Program and Implement a Prescribed Natural Fire Program Under Revised Fire Management Plan (Proposed Action)

All surface and some subsurface organic artifacts are at risk, to some degree, under all the alternatives. Fire has been influencing the Bandelier landscape and will continue to influence the landscape and associated cultural resources. As described above, some archaeological sites have been damaged by very high intensity wildfire (most recently the Dome fire 1996), but many more have been adversely affected by fire suppression operations and equipment.

Prescribed burning and limited mechanical removal of trees are conducted so that impacts to cultural resources are minimized. In fact, prescribed burning can, in some instances, actually enhance the value of the park's cultural resources. Existing sites are often revealed when fuels and vegetation are reduced. By the same token, however, exposed sites may become vulnerable to unauthorized collection or vandalism, although there is no evidence to date that supports this.

For Prescribed Natural Fires, a cultural clearance shall be part of the PNF Burnplan. The [PNF] Burnplan (formerly termed the Fire Situation Analysis) is the decision document for each PNF, and is updated daily during the incident. Cultural resources will be considered in any decision relating to ignitions being managed as a PNF. A qualified archaeologist will be involved with identifying any vulnerable sites in the area of the fire through site records and/or field reconnaissance. A cultural clearance will be completed prior to the signing of the

employed as directed by the resource advisor.

Mechanical Reduction of Hazard Fuels in the Piñon-Juniper Woodland and Mixed Conifer

Fuel reduction in these areas by mechanical means would generally be beneficial for cultural resources. Removal of logs and heavy woody debris would reduce potential for heat impacts resulting from fire within cultural sites. However, presence of workers in and around sites can carry a level of impact, particularly dragging large logs off of sites and breaking surface artifacts.

Impacts to Air Quality and Related Values

No Action (Continue Current Program of Limited Management-Ignited Prescribed Fire according to the Fire Management Plan approved in 1987)

By limiting the burn program to small acreage, within a time frame of one or two days, the smoke conditions are fairly accurately predicted and therefore somewhat more manageable. However, the current program would still periodically impair local and regional air quality for the burn's duration.

Expand Management-Ignited Prescribed Fire Program and Implement a Prescribed Natural Fire Program Under Revised Fire Management Plan (Proposed Action)

Bandelier National Monument is designated a Class I Airshed under provisions contained in the Clean Air Act and Amendments of 1977 and 1990 (P.L. 95-95, 91-Stat. 685; P.L. 95-1090, 91-Stat. 1399; P.L. 101-549, 104-Stat. 2399). Monitoring of fine particulates and visibility has been conducted in the park via particulate samplers and an automated 35mm camera system, which provides visual documentation of air quality and regional haze.

Generally, there will be more particulates emitted through prescribed fire treatment of larger areas under the revised Fire Management Plan. Regio

During a 360 hectare (900 ac) prescribed fire conducted in October 1992, the park received two documented complaints based on air quality impairment. This fire impacted the two local communities, Los Alamos National Laboratory, Santa Fe and several surrounding communities. However, public tolerance for short term visibility impairment resulting from prescribed fires appears high at this time.

Mitigation of smoke impacts consists of selection of prescription variables (i.e., wind direction and speed, atmospheric conditions, and moisture content of fuels) which regulate volume and density of smoke produced. Calculations of emissions, smoke transport and mixing heights are completed for each planned prescribed burn or PNF. Press releases, local agency notifications, signs, and other information is disseminated in a timely manner. Temporary monitoring equipment can be installed for potentially high impact MIPF or PNF activity.

The unmitigatable impacts to air quality are decreased visibility during some large prescribed fires and short term increases in particulate levels.

Mechanical Reduction of Hazard Fuels in the Piñon-Juniper Woodland and Mixed Conifer

Air quality related values will not be impacted by activities associated with mechanical reduction of fuels, with the minor exception discussed in the alternative above.

Impacts to Water Quality and Soils

One of the greatest impacts to water quality and soils is the total destruction of vegetative cover resulting from uncontrolled wildfire. The irony is that the very fuel conditions (i.e., dense thickets, heavy loadings of dead & down woody material) which contribute to the extreme intensities often encountered with these fire events were created by the long-term absence of fire. This is evidenced in part from the 1996 Dome fire, where localized slopes in the upper Capulin Canyon watershed were completely burned over from crownfire behavior.

No Action (Continue Current Program of Limited Management-Ignited Prescribed Fire according to the Fire Management Plan approved in 1987)

Although the continued implementation of this alternative would result in similar effects as described in the proposed alternative, the chances of more damaging wildfires is increased.

Expand Management-Ignited Prescribed Fire Program and Implement a Prescribed Natural Fire Program Under Revised Fire Management Plan (Proposed Action)

The environmental consequence of fire under this alternative would be to accelerate short-term sediment flow (erosion) in certain areas of the park. However, large wildfires such as the 1977 La Mesa fire (White & Wells, 1982; White, 1994) and the 1996 Dome fire (NPS, 1996) acted to destabilize soils and cause [locally] massive, unnatural erosion events.

This alternative would result over time in reducing the potential for this large-scale, severe erosion type event such as found with wildfires. In the long term, the decreasing erosion potential will contribute greatly to stability of cultural sites and associated materials, through enhancement of soil-binding herbaceous ground cover.

Mechanical Reduction of Hazard Fuels in the Piñon-Juniper Woodland and Mixed Conifer

Under this alternative, treated areas may experience some limited additional runoff due to the reduction of foliage interception of rain, particularly during the summer monsoon season (July-August). However, live tree removal would be kept to an absolute minimum. Some minor trenching may encourage erosion channel development on exposed mesas resulting from wood removal operations (dragging). Otherwise, there would be no significant impact.

Impacts to Threatened and Endangered Species

No Action (Continue Current Program of Limited Management-Ignited Prescribed Fire according to the Fire Management Plan approved in 1987)

Under this alternative, it is unlikely that limited burns would result in adverse impacts to species either listed, proposed, or otherwise sensitive within the park. As stated above, the consequence of more suppression of wildfires increases the potential for habitat damage and human-induced harassment of the animal species.

Expand Management-Ignited Prescribed Fire Program and Implement a Prescribed Natural Fire Program under revised Fire Management Plan (Proposed Action)

The most significant potential impacts to listed species from large prescribed fires is to the Mexican spotted owl (Strix occidentalis var. mexicanus). As stated on page one (Objectives and Constraints), Bandelier will defer MIPF in spotted owl habitat until such time as the "no affect" biological opinion is issued by the U.S.

Fish and Wildlife Service. Instead, the parameters listed in the Recovery Plan [for the spotted owl] will be observed.

Peregrine falcon (Falco peregrinus) habitat exists within park boundaries. The primary impacts to this species is human presence, particularly during nesting season. The mitigation of choice is to select the time of year and environmental conditions to prepare and conduct prescribed fires when disturbance is minimal. In accordance with the Peregrine Habitat Management Plan (approved May, 1995) developed by T. Johnson in consultation with park staff, all prescribed fire management activities would be restricted in sensitive zones during critical time frames. Wildfire suppression activities will continue as necessary, but under more restrictive conditions within sensitive zones. Again, proper preplanning of prescribed burns which may include consultation with local experts knowledgeable of the species and habitat is prerequisite to mitigation.

There is no owl habitat located within the proposed PNF area of the park; therefore, mitigating measures are not indicated.

The southwestern willow flycatcher, Empidonax traillii estimus, is now listed as "endangered". However, this species' habitat is unlikely to be affected by wildfires, because the habitat preferred is moist and fuel conditions do not readily maintain fire except under the most extreme cases.

The category 2 (C2) candidates represent another group worthy of mention. These listings are maintained by the U.S. Fish and Wildlife Service as potential for threatened or endangered. These species have no legal protection; however, the protection of habitat for these species would be considered in the planning process for prescribed fire treatments. The two species known to occur in the park and most likely affected by high intensity wildfires are the Jemez Mountains salamander (Plethodon neomexicanus) and the northern goshawk (Accipiter gentilis).

In the case of the salamander, neither MIPF nor PNF would adversely impact the species due to salamander preference for subterranean niches well below any heat penetration. All fire management activities would be restricted in sensitive zones during critical time frames. Fire line would not be constructed through suitable habitat unless deemed absolutely necessary by the Superintendent's Agency Representative with input from the resource advisor during a wildfire situation. In the instance where it is deemed necessary to construct fire line through suitable habitat, natural barriers would be utilized as a first option in delimiting the burn unit; minimal line construction techniques (i.e., removal of duff layer only) would be used as a last resort or as needed to link natural barriers. All fireline would be rehabilitated (i.e., by pulling the duff back onto the line) within one week after the fire is declared out.

Northern goshawk utilizes a wide range of successional forest conditions for foraging and would likely find an increased prey base as a result of fire management activities. As with other sensitive raptor species, all fire management activities would be restricted in sensitive zones during critical time frames.

Mechanical Reduction of Hazard Fuels in the Piñon-Juniper Woodland and the Mixed Conifer

Similar to the alternative above, any planned treatment areas would receive a professional assessment as to possible impacts to resident or transient species. Timing and standards of work could be established so as to minimize or totally avoid species and/or elements of habitat required by listed species.

Impacts to Other Plants and Animals

No Action (Continue Current Program of Limited Management-Ignited Prescribed Fire according to the Fire Management Plan approved in 1987)

Prescribed burning would significantly contribute to restoration and maintenance of naturally functioning ecosystems. This alternative suggests that this restoration and maintenance process be more restrictive, however. The long-term result is increased potential for large, highly destructive crown fires which would alter wildlife habitats and plant communities over large areas. Impacts that cannot be mitigated would include some plant and animal mortality and charred tree trunks.

Expand Management-Ignited Prescribed Fire Program and Implement a Prescribed Natural Fire Program Under Revised Fire Management Plan (Proposed Action)

The plants and animals native to the park, including sensitive species, evolved with naturally-occurring fires. Loss of the critical role of fire has caused compositional and structural changes in the plant communities and habitat loss for many animals. The ecosystem types most at risk due to the absence of fire are: Cerro Grande savannas, aspen stands, Gambel's oak woodlands, ponderosa pine forests, and pinyon-juniper woodlands.

Fires have both direct and indirect impacts on animals. Some animals, such as the wood rat (*Neotoma* spp.) are directly impacted by fire if their stick nests are consumed. Some snags (dead standing trees) that provide habitat for cavity-nesting species are consumed, while new snags are created. Cover is reduced for some species, particularly rodents, which benefits other species such as raptors. In general, the fires that result in the most habitat damage are those that consume

large volumes of organic material very rapidly. Prescribed fires (both MIPF and PNF) usually burn with varying intensities and rates of spread, leaving unburned islands of vegetation and adequate propagules for rapid soil stabilization. Consequently, species abundance can be impacted for short periods, until numbers recover. The park maintains information on sensitive biota, which is used to avoid unnecessary adverse impacts.

Prescribed fire under this alternative would restore and maintain naturally-functioning ecosystems that support sensitive species. These fires would cover larger areas more quickly and the monitoring program would provide statistically valid data for effective program evaluation. Impacts that cannot be mitigated would include some plant and animal mortality.

Mechanical Reduction of Hazard Fuels in the Piñon-Juniper Woodland and Mixed Conifer

With limited areas being affected, there should be no adverse impacts to other animals' abundance or habitat.

Impacts to Wetlands/Riparian Zones and Floodplains

No Action (Continue Current Program of Limited Management-Ignited Prescribed Fire according to the Fire Management Plan approved in 1987)

Continued implementation of this alternative will likely result in minor impacts associated with longer firelines and more mineral soil exposure. Potential major impacts to riparian system is greater, given the increased likelihood of large, high intensity wildfire events. Runoff would increase, carrying greater sediment loads into the streams and covering streamside vegetation.

Expand Management-Ignited Prescribed Fire Program and Implement a Prescribed Natural Fire Program Under Revised Fire Management Plan (Proposed Action)

According to White (1981) who reported on geomorphic effects of the 1977 La Mesa Fire, the lower mesas of the park are more susceptible to erosion, and therefore greater sediment runoff than the upper mesas of the Frijoles watershed. Changes from moderate to low sediment yield on the upper mesas is attributable to rapid revegetation on better developed soils coupled with greater amounts of precipitation. Large floods (resulting from the 1977 La Mesa Fire) occurred in lower Frijoles Canyon, the major drainage feature of the park. These floods resulted from widespread severe devegetation from wildfire combined with heavy summer (monsoonal) precipitation. With carefully planned and scheduled

prescribed fire treatments combined with appropriate PNF parameters, the upper canyons and headwaters soils should not be significantly affected.

The Dome fire (1996) burned in a mosaic pattern. Of the total acreage burned, only a small portion burned with moderate or high intensity. Although assessments of effect are early as yet, the (Burned Area Rehabilitation Team) found local areas where the ashes and soils were unstable, which may require several years to recover to an acceptable rate of sedimentation (NPS, 1996). During the summer of 1996, the monsoon period (July - September) brought several major flood events in Capulin Canyon.

Prescribed fires under this proposal would also accelerate the thinning of vegetation and fuels and would remove ladder fuels (i.e., those with vertical continuity) in riparian zones. Very minor, localized sediment movement into streams may originate from pockets of higher burn severity where fuels are concentrated.

Generally, riparian zone vegetative communities (comparatively much wetter normally) are less dependent on periodic fire for maintenance than other park areas. Therefore, they are vulnerable to wildfire for shorter time periods throughout the fire season (late spring and summer months), particularly when fuel conditions are dryer and more flammable.

The potential effects of this proposed action on wet meadows is uncertain. It is possible that hydrologic changes from consumption of large areas of vegetation resulting from wildfire would cause meadows to increase in available moisture due to decreasing evapotranspiration. Some mechanical removal of invading trees followed by lower intensity prescribed fire treatment may be necessary to maintain meadow health and vigor. Vegetative diversity of native plant species will also be encouraged through carefully planned, periodic fire treatments.

Mechanical Reduction of Hazard Fuels in the Piñon-Juniper Woodland and Mixed Conifer

Mechanical reduction under this alternative would impact such a small area that only the most local conditions may be affected. Riparian areas such as streambeds and immediate surroundings would not be a target for mechanical reduction except only in the most isolated cases. As potential flammability would be reduced in these areas, a net positive effect such as reduced erosion potential should be realized.

Impacts to Wilderness and Scenic Values

No Action (Continue Current Program of Limited Management-Ignited Prescribed Fire according to the Fire Management Plan approved in 1987)

Under the current program, the main impacts to wilderness would continue to be noise from limited, pre-authorized use of chainsaws for wildfire suppression and prescribed burn unit preparation. Stumps would be flush-cut to ground level to mitigate visual impacts.

Expand Management-Ignited Prescribed Fire Program and Implement a Prescribed Natural Fire Program Under Revised Fire Management Plan (Proposed Action)

All of the impacts discussed in the current program would be essentially the same for this proposed action. With expansion of the prescribed fire program, however, chainsaw use (with occasional portable pump use with water only) would increase to some degree. Burn unit preparation in wilderness would involve clearing control lines, removing logs from archaeological sites, and breaking up heavy concentrations (piles) of fuels near control lines.

Prescribed natural fire management may involve very limited saw use to remove heavy logs from in or around cultural sites, or to perform limited control actions to keep the fire within predetermined limits.

Weather monitoring equipment may be established temporarily before, during and after prescribed fires. It will subsequently be removed from the site.

It is estimated that noise intrusion into the wilderness would occur at least twice per year for short time periods (about 2 weeks maximum) for MIPF; and for an estimated 2-10 additional days for PNF.

Scenic (visual) values within and around fire-treated areas would be adversely impacted temporarily, for approximately 1 to 3 growing seasons depending on the site. A wilderness user would likely encounter scorch and char of trees, including standing tree remains (snags). Foliage often discolors to a brown or yellowish appearance until needles drop off. As some users are unaccustomed to seeing some level of blackened and discolored landscape, the appearance can be unpleasant to the eye. However, as the park's public education program emphasizes, these temporary processes are a very healthy and crucial part of a well-functioning ecosystem.

If this alternative is not implemented, opportunities for large and destructive wildfires will increase, completely altering the visual landscape. Large burn areas, such as that resulting from the 6,000-plus hectares (15,000 ac) 1977 La Mesa Fire and some of the 4,500-plus acres of the 1996 Dome fire would remain blackened for at least 15 to 20 years while revegetation naturally occurs. These impacts are not acceptable, nor do they have to occur given management intervention proposed here.

Mechanical Reduction of Hazard Fuels in the Piñon-Juniper Woodland and Mixed Conifer

With severe constraints on the use of any mechanical devices in the wilderness, it is unlikely that this alternative would be deemed feasible by management.

CONSULTATION AND COORDINATION

This Environmental Assessment been developed under close consultation with the key staff in the Southwest System Support Office of the National Park Service (these persons are identified in the next section).

This Environmental Assessment will be distributed to the following list of Federal, state and local government agencies, as well as interested and concerned private agencies, organizations and individuals. Following a 15-day review period, public comments will be evaluated and a decision document prepared. The decision document will be distributed to those who comment on this Environmental Assessment or who ask to receive a copy.

(Preparer's note: the public review period began on July 10 and end on July 26, 1995 and comments incorporated. Due to unavoidable delays associated with key staff availability in late 1995 and the 1996 severe fire season and park wildfire emergency, followup action on this document resumed in Nov. 1996.)

Distribution List

State Offices

Governing Entities

Pueblos

Governor
Pueblo of Cochiti
P.O. Box 70
Cochiti, NM 87041

Governor
Pueblo of San Ildefonso
Rt. 5, Box 315-A
Santa Fe, NM 87501

Governor
Pueblo of Santo Domingo
P.O. Box 9
Santo Domingo Pueblo, NM 87052

State Historic Preservation Office
228 E. Palace Ave
Room 320
Santa Fe, NM 87503

Federal Agencies or Offices

Ecological Services Branch
US Fish and Wildlife Service
Ste D, 3530 Pan American Hwy NE
Albuquerque, NM 87107

US Department of the Interior
Gayle Manges, Regional Solicitor
Santa Fe Field Office
Southwest Region
P.O. Box 1042
Santa Fe, NM 87504-1042

Sig Hecker
Director (MS-A100)
Los Alamos National Laboratory
Los Alamos, NM 87545

Los Alamos National Laboratory
Community Reading Room
1315 Central, Suite 101
Los Alamos, NM 87545

Jerry Bellows (MS-A316)
Area Manager
Department of Energy
Los Alamos Area Office
Los Alamos, NM 87545

US Forest Service
Santa Fe National Forest
Española District
District Ranger
P.O. Drawer R
Española, NM 87532

US Forest Service
Santa Fe National Forest
Jemez District
District Ranger
Jemez Springs, NM 87025

US Forest Service
Santa Fe National Forest
Forest Supervisor
P.O. Box 1689
Santa Fe, NM 87501

Other Agencies or Organizations

Mesa Public Library
1742 Central Ave
Los Alamos, NM 87544

Mesa Public Library
White Rock Branch
115 B Longview Dr
White Rock, NM 87544

City of Santa Fe Public Library
Main Office
145 Washington Ave
Santa Fe, NM 87501

La Farge Branch Library
1730 Llano
Santa Fe, NM 87543

Friends of Bandelier
Dorothy Hoard, Director
11 Los Arboles Dr.
Los Alamos, NM 87544

Jim Norton
Southwest Regional Director
The Wilderness Society
510 Galisteo St
Santa Fe, NM 87501

Dave Simon
Southwest Regional Director
National Parks and Conservation
Association
823 Gold Ave, S.W.
Albuquerque, NM 87102

Sam Hitt
Forest Guardians
612 Old Santa Fe Trail
Santa Fe, NM 87501

Dave Henderson
Sangre de Cristo Audubon
P.O. Box 9314
Santa Fe, NM 87501

**Individuals Who Have Expressed
Interest:**

Terrell Johnson

Tom Ribe

Roger Stutz

Dorothy Hoard

PREPARER/REVIEWERS

NAME	Association	Contributions
John Lissoway	Fire Management Officer (Retired), Bandelier NM	EA Preparation
Craig Allen	Ecologist, U.S. Geological Survey	Ecological Impacts Review
Brian Jacobs	Resource Management Specialist, Bandelier NM	Document Review
Terrell Johnson	Raptor Consultant	T&E Species Impact Mitigation Advice
Nancy Skinner	Natural Resource Specialist, Southwest SSO	Coordinate Regional EA Review
Charisse Sydoriak	Chief, Resource Management, Bandelier NM	Document Review and Action Advice
Roy Weaver	Superintendent, Bandelier NM	Document Review
Elizabeth Mozzillo	Archeologist, Bandelier NM	Document Review
Stephen Fettig	Wildlife Biologist, Bandelier NM	Document Review

REFERENCES CITED

- Allen, C.D. 1989. Changes in the landscape of the Jemez Mountains, New Mexico. Ph.D. dissertation, Univ. California, Berkeley. 346 p.
- Caprio, A.C., C.M. Baisan, P.W. Brown, and T.W. Swetnam. 1988. Fire scar dates from Bandelier National Monument, New Mexico. Unpublished report on file at Bandelier National Monument, New Mexico. 49 p.
- Head, 1992, The Bandelier Archeological Survey: 1991 Preliminary Report, manuscript on file at Division of Anthropology, Southwest Region, National Park Service. p.7
- Johnson, T. 1993. Personal communication. Raptor Consultant, P.O. Box 327, Los Alamos, New Mexico, 87544.
- Johnson, T. and J. Johnson, 1991. Status of the Spotted Owl in the Jemez Mountains--1991. Unpublished report on file at Bandelier National Monument, New Mexico. 9 p.
- Lissoway, J.D. and J. Propper, 1988. Effects of Fire on Cultural Resources. Manuscript on file, USDI, National Park Service, Bandelier National Monument, New Mexico. 9 p.
- NPS, Bandelier National Monument. 1986. Fire Management Plan. Bandelier National Monument, New Mexico.
- NPS, 1988 Management Policies. p.1, B-3.
- NPS, 1995 Bandelier National Monument Resources Management Plan. p.1 and C-1.
- NPS, 1992 Western Region Fire Monitoring Handbook, p.5
- NPS, 1996 Dome Fire Burned Area Emergency Rehabilitation (BAER) Plan. 135 p. + 5 appendices.
- Swetnam, T.S. 1990. Fire history and climate in the Southwestern United States. p.6-17 in: Krammes, J.S. (tech. coord.), Effects of Fire Management of Southwestern Natural Resources. Gen. Tech. Rep. RM-191, USDA For. Serv. Rocky Mt. For. Rge. Exp. Sta. 293 p.

Traylor, D. and L. Hubbell, N. Wood, B. Feidler, 1978. The La Mesa Fire study: investigation of fire and fire suppression impact of cultural resources in Bandelier National Monument (draft).

Touchan, R., and T.W. Swetnam. 1992. Fire History of the Jemez Mountains: Fire Scar Chronologies from Five Locations. Unpublished final report on file at Bandelier National Monument, New Mexico. 22 p + 28 figures + 2 appendices.

U.S. Department of the Interior, National Park Service. 1990. Wildland Fire Management Guideline, NPS-18. U.S. Govt Printing Office, Wash, D.C.

U.S. Department of the Interior, Fish and Wildlife Service. 1995. Recovery Plan for the Mexican spotted owl: Vol.I. Albuquerque, New Mexico. 172 pp.

White, C. 1994. The Effects of Fire on Nitrogen Cycling Processes Within Bandelier National Monument, New Mexico. Draft manuscript on file, Bandelier National Monument, New Mexico.

White, W.D., 1981. Effects of forest fire devegetation on watershed geomorphology in Bandelier National Monument, New Mexico. M.S. thesis, University of New Mexico (unpublished).

White and Wells, 1984, Geomorphic Effects of La Mesa Fire. In: La Mesa Fire Symposium. pp. 73-90.

GLOSSARY

Crownfire: fire behavior characterized by an intermittent or sustained fire front moving through the upper portions of tree canopy, usually followed behind by the surface fire.

Fire Monitoring: the act of observing a fire to obtain information about its environment, behavior, and effects for the purpose of evaluating the fire's objectives and/or prescription.

Fugitive Dye Retardant: a substance which, when applied to fuels (typically aerially delivered), tends to temporarily retard the flammability of fuels; the dye normally fades completely within several days following application.

Management-Ignited Prescribed Fire: a fire deliberately ignited by land managers within a pre-determined prescription in order to achieve approved resource management objectives.

Prescribed Natural Fire: a fire ignited by natural means (usually lightning) which is permitted to burn under specific environmental conditions, in preplanned locations, with adequate fire management personnel and equipment available to achieve defined objectives.

Prescription: a written statement defining the objectives to be attained; and conditions of temperature, humidity, wind direction and speed, and fuel moisture, under which, if met, a fire will be ignited and/or allowed to burn.

APPENDIX A. Ten-Year Prescribed Fire Schedule

UNIT	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
UF-1					1109F						
UF-5				150F							
UF-7			356F								
UF-8									158S		
UF-9	1227S										1227S
UF-12		1425S									
UF-14	1100F									1100F	
UF-27						270F					
UF-28									200S		
UF-29		650F									
UF-30		500F									
UF-38			700S								
HQ-40										570S	
HQ-41		300S									
HQ-44						76S					300S
HQ-45			420S								
BW-48	300S										
BW-49							340F				
BW-50							320S				
BW-54						850S					
BW-55				1250S							
BW-56								340F			
BW-57								400F			
BW-58									310F		
BW-59									420F		
BW-60	100S										
BW-51				600S							
Totals	2916	2925	1476	2000	1109	1196	660	740	1088	1670	1527

LEGEND

- 1) Burn unit numbers are keyed to the attached maps.
- 2) UF = Upper Frijoles
HQ = Headquarters
BW = Bandelier Wilderness
- 3) S = Spring burn (includes Dec-June months)
F = Fall burn (includes July-Nov months)
- 4) Schedule is subject to change based on unpredictable circumstances.
- 5) Burn unit acreages indicated are approximate.

APPENDIX B. Applicable Laws and Regulations

Federal Laws

Archaeological Resources Protection Act of 1979, as amended
PL 96-95, 93 Stat 721, 16 USC 470a et seq.

Antiquities Act of 1906
PL 59-209, 34 Stat 225, 16 USC 431--433
43 CFR Part 3 -- Preservation of American Antiquities

Bald and Golden Eagle Protection Act
54 Stat 250, 16 USC 668 et seq., originally enacted 1940
PL 86-70, 73 Stat 143 -- June 25, 1959
PL 87-884, 76 Stat 1246 -- October 24, 1962
PL 92-535, 86 Stat 1064 -- October 23, 1972

Bandelier Wilderness -- PL 94-567
Oct. 20, 1976, 90 Stat 2692 -- Bandelier Wilderness established with 23,267 acres.

Clear Air Act and Amendments of 1977 and 1990
PL 95-95, 91 Stat 685
PL 95-1090, 91 Stat 1399
PL 101-549

Endangered Species Act of 1973, as amended
PL 93-205, 87 Stat 384, 16 USC 1531 et seq.
PL 94-325, 90 Stat 724, as amended June 30, 1976
PL 94-359, 90 Stat 911, as amended July 12, 1976
PL 95-212, 91 Stat 1493, as amended December 19, 1977
PL 95-632, 92 Stat 3751, as amended November 10, 1978

Federal Water Pollution Control Act of 1972 (Clean Water Act)
33 USC 1251-1265, 1281-1292, 1311-1328, 1341-1345, 1361-1376; 86 Stat 816, as amended
PL 92-500, 86 Stat 877, 33 USC 1341 et seq.
1987 Federal Water Quality Act

National Historic Preservation Act of 1966, as amended

PL 89-665, 80 Stat 915-919, 16 USC 470 et seq.,
PL 91-243, as amended
PL 93-54, as amended
PL 94-422, Title II, as amended -- 1976 (NOTE: this law is part of the Land
and Water Conservation Fund Act)
PL 94-458, as amended
PL 96-199, as amended
PL 96-244, as amended
PL 96-515, 94 Stat 2987, as amended December 12, 1980
36 CFR Part 60 -- National Register of Historic Places
36 CFR Part 61 -- Procedures for approved state and local government
historic preservation programs
36 CFR Part 63 -- Determinations of eligibility for inclusion in the National
Register of Historic Places
36 CFR Part 800 -- Protection of historic and cultural properties
36 CFR Part 800 Appendix A: Guidelines for making "adverse effect" and
"no adverse effect" determinations for archaeological resources in accordance
with 36 CFR Part 800

National Park Service Authorities Act

PL 94-458; 16 USC 1a et seq.

National Park Service Organic Act of 1916 (NPS Organic Act)

PL Chapter 408, 39 Stat 535 et seq., 16 USC 1
PL 64-235, 16 USC ss1, 2-4, as amended)

The establishing legislation of the National Park Service, known as the
Organic Act, charges the Service to "promote and regulate the use of the
Federal areas known as...monuments...to conserve the scenery and the natural
and historic objects and the wild life therein...in such manner and by such
means as will leave them unimpaired for the enjoyment of future generations.
16 USC § 1 (1988)."

National Park System Act of 1976

PL 94-578 Sec. 309 -- 4234 acres of the Cañada de Cochiti Grant and 3076
acres of the headwaters of the Rito de los Frijoles authorized for acquisition
and addition to Bandelier National Monument

Wilderness Act of 1964

PL 88-577, 78 Stat 890, 16 USC 1131 et seq.

Executive Orders

E.O. 11593: Protection and Enhancement of the Cultural Environment
36 FR 8921: May 13, 1971
36 CFR Part 60 -- National Register of Historic Places
36 CFR Part 63 -- Determinations of eligibility for inclusion in the National Register of Historic Places
36 CFR Part 800 -- Procedures for the protection of historic and cultural properties

National Park Service Policies

NPS Wildland Fire Management Guideline (NPS-18, 1990) states that:

Any area with vegetation capable of supporting fire will develop a Fire Management Plan.

NPS Management Policies (1988) states that:

Fire-related management objectives will be clearly stated in a fire management plan, which is to be prepared for each park with vegetation capable of burning, to guide a fire management program that is responsive to park needs.

APPENDIX C. Resource Management Goals and Objectives

The following text was taken from the Bandelier National Monument Resource Management Plan (NPS 1995).

Bandelier's overriding resource management goals are to:

- (1) preserve, understand, protect, and manage the cultural and natural resources of the park within naturally functioning ecosystems, consistent with cultural resource preservation; and
- (2) provide the means and opportunity for people to study, understand and enjoy the resources of the monument without unduly compromising the resources or ethnographic values.

The park's cultural resource management objectives are to:

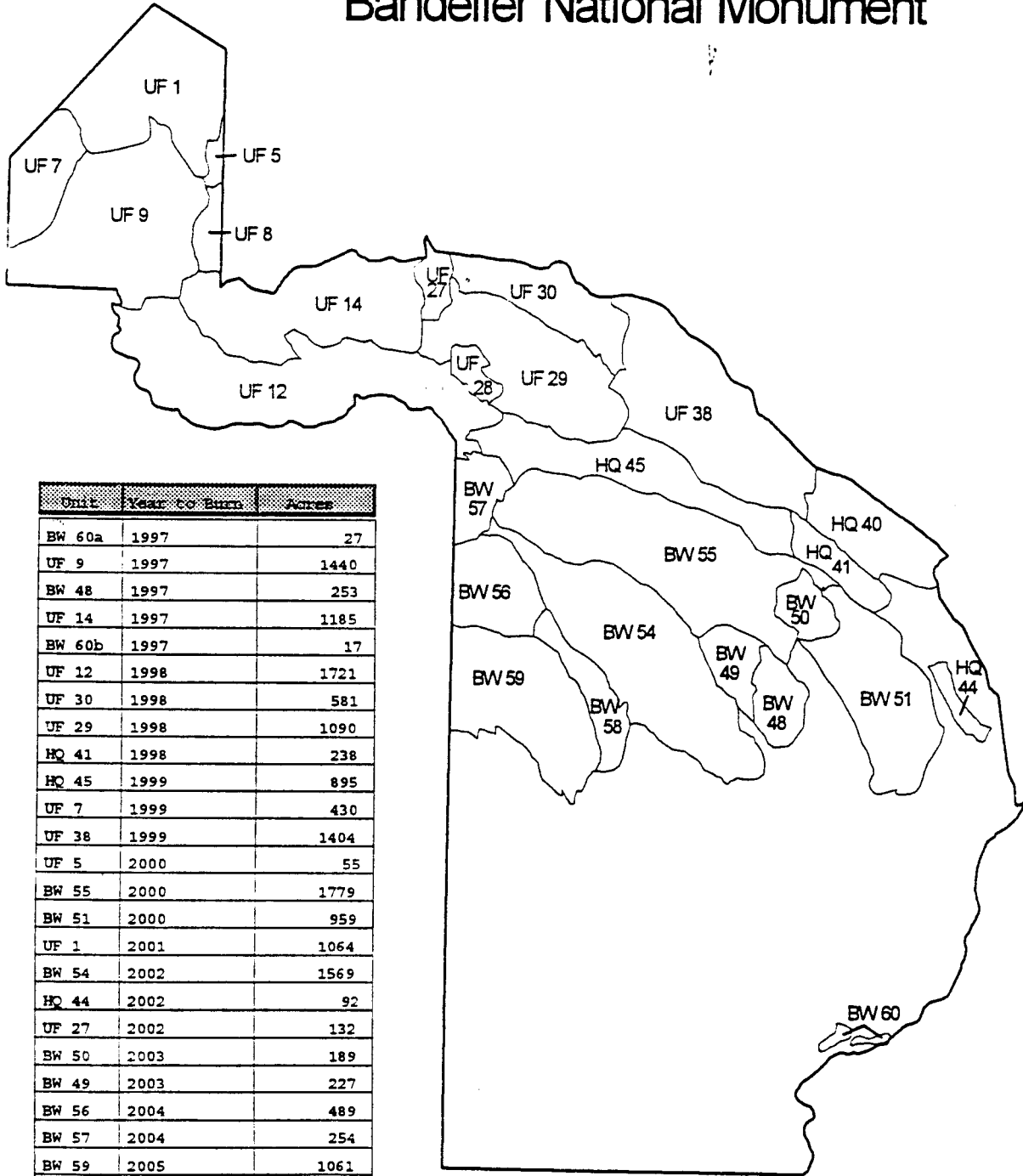
- (1) maintain the historic and prehistoric resources of the park for research and public enjoyment. (Loss of the resource due to natural decay is acceptable, but any loss due to past or present human actions is not acceptable.)
- (2) further understanding of how prehistoric and historic peoples of the Bandelier area interacted with their environment and resource base; and
- (3) maintain an open, consultative relationship with tribal communities that have ancestral ties to the park.

The park's natural resource management objectives are to:

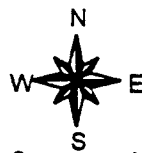
- (1) restore and sustain natural ecosystem conditions and processes unimpaired from human influence, to the degree practicable given landscape and cultural resource constraints;
- (2) carry out a wilderness management program which preserves and restores resource conditions and values defined by law and policy and is compatible with cultural resources management objectives; and
- (3) preserve a comprehensive natural resource base for its value to promote scientific and educational interest.

APPENDIX D. Management Ignited Prescribed Fire Unit Map

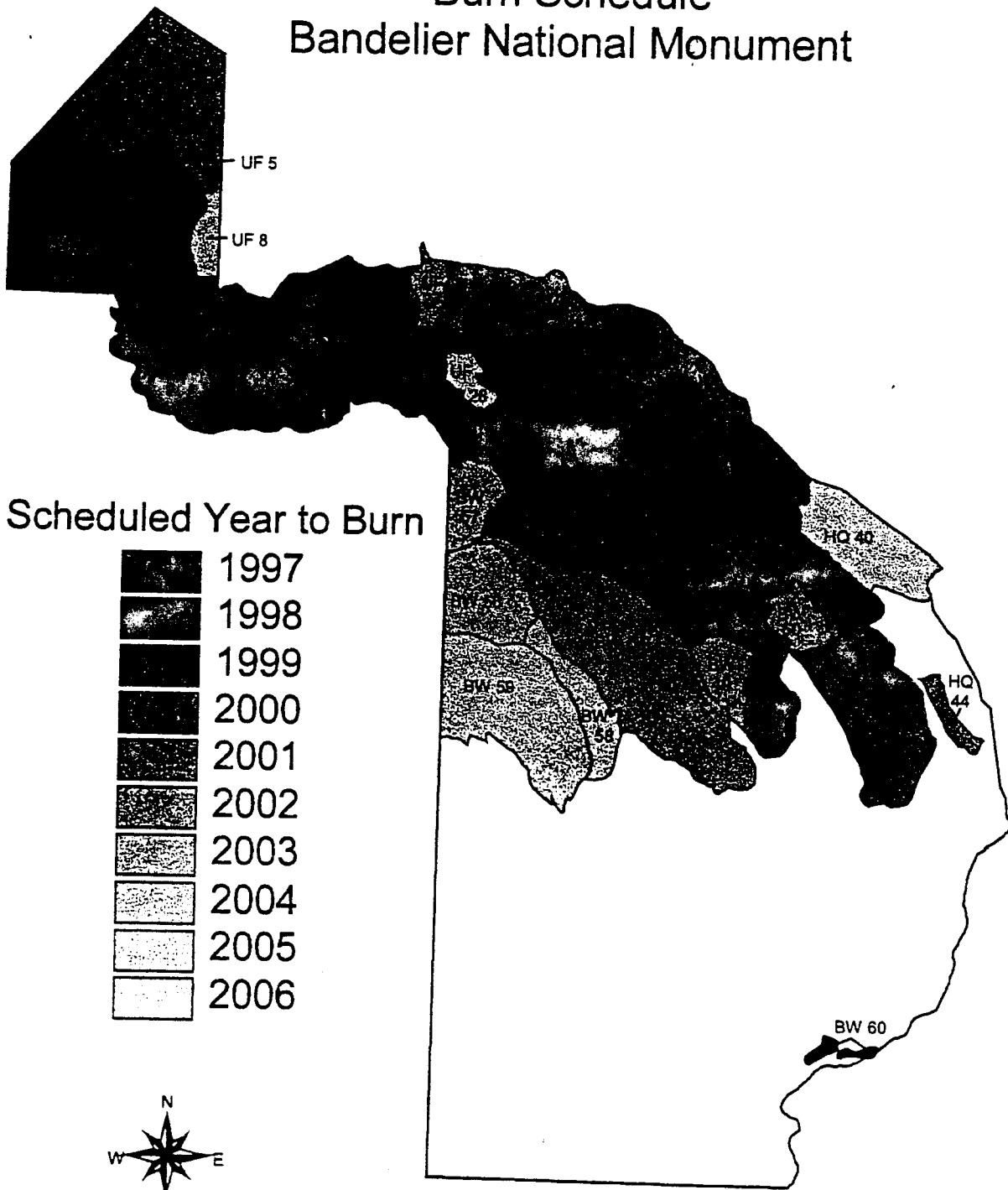
Management Ignited Prescribed Fire Units Bandelier National Monument



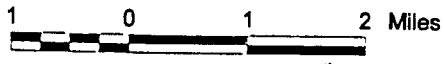
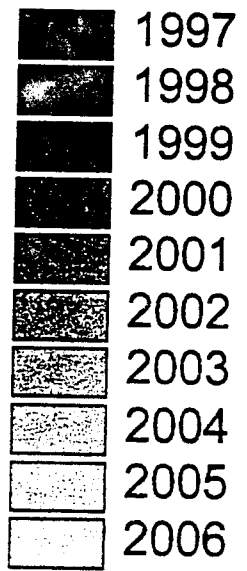
Unit	Year to Burn	Acres
BW 60a	1997	27
UF 9	1997	1440
BW 48	1997	253
UF 14	1997	1185
BW 60b	1997	17
UF 12	1998	1721
UF 30	1998	581
UF 29	1998	1090
HQ 41	1998	238
HQ 45	1999	895
UF 7	1999	430
UF 38	1999	1404
UF 5	2000	55
BW 55	2000	1779
BW 51	2000	959
UF 1	2001	1064
BW 54	2002	1569
HQ 44	2002	92
UF 27	2002	132
BW 50	2003	189
BW 49	2003	227
BW 56	2004	489
BW 57	2004	254
BW 59	2005	1061
UF 28	2005	115
UF 8	2005	129
BW 58	2005	302
HQ 40	2006	563



Management Ignited Prescribed Fire Units Burn Schedule Bandelier National Monument



Scheduled Year to Burn





United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 761-4525 Fax: (505) 761-4542

December 4, 1995

Cons. #2-22-95-I-532

RECEIVED
DEC 5 1995
BANDOLIER N

Roy Weaver, Superintendent
National Park Service
Bandelier National Monument
HCR 1, Box 1, Suite 15
Los Alamos, New Mexico 87544-9701

Dear Mr. Weaver:

This is in response to your September 15, 1995, letter requesting our concurrence with the determination that implementation of Bandelier National Monument's Fire Management program may affect, but is not likely to adversely affect proposed, threatened, or endangered species. These species include the threatened Mexican spotted owl (*Strix occidentalis lucida*) (owl) and bald eagle (*Haliaeetus leucocephalus*), and the endangered southwestern willow flycatcher (*Empidonax trailii extimus*) and peregrine falcon (*Falco peregrinus anatum*). No federally proposed species occur within Bandelier National Monument. The U.S. Fish and Wildlife Service (Service) offers the following comments on the Biological Assessment (BA) for the implementation of the Fire Management Plan for Bandelier National Monument.

After reviewing the Biological Assessment for the implementation of the Fire Management Plan, we would first like commend Bandelier National Monument for the caliber of data that went into the report. We applaud your efforts to produce an implementation plan based on the best scientific data available. We support the use of fire as a tool to restore ecosystem processes and re-establish more natural fire regimes. The Service also supports the use of prescribed natural fire to thin overstocked dense stands of immature conifers, to lessen the possibility of future catastrophic fires, and to help manage habitat for specific plant and wildlife species adapted to natural fire and subsequent habitat succession. The Service agrees that lower intensity prescribed natural fire may have some short-term negative effects to owl habitat but much less than a large catastrophic fire that would severely impact habitat conditions. During a October 19, 1995, conference call between Steve Fettig and John Lissoway of your staff and Carol Torrez and David Leal of this office, it was mentioned that monitoring small mammal populations was a possibility. The Service encourages monitoring efforts since little is known about fire and how it affects the owl's prey base.


The Service concurs with your determination that implementation of Bandelier National Monument's Fire Management program may affect, but is not likely to adversely affect

the bald eagle, southwestern willow flycatcher, and peregrine falcon. However, before we can concur with your determination for the owl, the Service has several comments on implementation of the fire plan and its consistency with the Recovery Plan for the owl. Although the BA states that surveys for owls will be conducted before areas containing nesting and roosting habitat are burned, the Recovery Plan for the owl recommends that nest sites be located before burning commences. Further, the Recovery Plan recommends establishing protected activity centers (PACs) around each owl site. Burning within PACs is encouraged. We are aware that according to unpublished reports, owls in Bandelier National Monument appear to be nesting on cliff ledges near cool, mesic riparian areas and that these areas tend not to burn as hot as other more xeric areas. However, our concern for finding nest sites and establishing PACs stems primarily from our commitment to consistency of fire management in owl habitat by all action agencies.

The final Recovery Plan for the owl will be available in December 1995 or January 1996. We suggest additional communication regarding our concerns once your biologists have perused the Recovery Plan. We are confident that our concerns can be resolved and that your project will not suffer further delays.

We appreciate the opportunity to comment on this project and we look forward to your response to our concerns. For future communication on this project, please refer to consultation #2-22-95-I-532. If we can be of further assistance, please contact Carol Torrez or David Leal of my staff at (505) 761-4525.

Sincerely,



Jennifer Fowler-Propst
Field Supervisor

cc:

Regional Director, U.S. Fish and Wildlife Service, Albuquerque, New Mexico
Field Supervisor, U.S. Fish and Wildlife Service, Arizona Ecological Services Field
Office, Phoenix, Arizona

Terrell H. Johnson
PO Box 327
Los Alamos, NM 87544

September 5, 1995

Mr. Roy Weaver, Superintendent
Bandelier National Monument
HCR 1, Box 1, Suite 15
Los Alamos, NM 87544-9701

RECEIVED
SEP - 8 1995
BANDELIER NM

Dear Roy:

Thank you for sending the environmental assessment for the draft Fire Management Plan. I fully support the movement toward a prescribed natural fire program. The description of measures to protect spotted owls and their habitats during prescribed burns seems complete, but more should be said about prescribed natural fires.

The statement (p. 17) that no owl habitat is within the proposed PNF area of the park is incorrect. Suitable nesting and roosting habitat are located within both the conditional and unconditional PNF zones outlined in Appendix E. However, I believe that prescribed natural fires should be allowed to burn within suitable spotted owl nesting and roosting habitat, even during the breeding season. Spotted owls evolved with natural fire, and are likely to be largely unaffected by it for the following reasons:

- 1) Most lightning ignitions will occur on the mesas, not in the canyons where spotted owls nest and roost.
- 2) Prescribed natural fires would not be allowed unless fuel loading and weather conditions would produce low fire intensities, especially in the cool, moist areas favored by spotted owls for nesting and roosting.
- 3) Prescribed natural fires are likely to produce the benefits of prescribed burning by maintaining nesting and roosting habitat, insuring against high intensity wildfire, and improving the prey base.
- 4) Spotted owls in Bandelier nest almost exclusively on cliffs, and therefore would have low vulnerability to low intensity fires, except for a short period after young have emerged from the nest.
- 5) Monitoring prescribed natural fires is unlikely to cause disturbance and can easily be managed, compared to setting and controlling prescribed burns, which should be excluded from sensitive areas during the breeding season.

September 2, 1995

Roy Weaver Superintendent
Bandelier National Monument
HCR-1, Box 1, Suite 15
Los Alamos NM 87544

RECEIVED
SEP - 6 1995
BANDIELIER NM

Dear Superintendent Weaver:

Thank you for the opportunity to comment on the draft Fire Management Plan.

I support Alternative B, your proposed action.

Here are my comments on the plan:

- *Initial fire schedule.* Under current conditions, a fire produces large areas of dead, but unburned, material. It seems to me that these standing dead forests create a massive fuel load that presents a greater fire hazard than the burn was designed to alleviate. Your fire schedule on page A-1 indicates a six- to eight-year burn schedule. It seems to me that a shorter time period between the first and second burn would be more advantageous in establishing the conditions you wish to create and maintain. I think of the burn in Upper Frijoles along SR 4 as an example of an area that should receive quicker retreatment, if only for safety considerations.
- *Montane grasslands.* This plan does not give a rationale for cutting trees on the grasslands other than attempting to recreate alleged past conditions. (I am aware of the invasion of forest into the grasslands. I presume the ultimate goal is to remove all trees from the area of deep A horizon.) It seems to me the goal should be the healthiest forest/grassland mix under current conditions. My principal concern here is the wisest use of limited resources for ecosystem management.
- *Regulatory involvement.* I feel the current regulatory climate is overly burdensome. It consumes too much of your resources and those of the regulatory agencies. I urge you and your people to identify areas of your management plan that truly require oversight and those that are guided scientifically, then work with the National Park Service and other agencies to achieve regulatory balance. I also urge you to continue your public awareness program for fire management.

I wish you success in your fire management endeavors.

Sincerely,

Dorothy Hoard



FINDING OF NO SIGNIFICANT IMPACT
FOR THE
FIRE MANAGEMENT PLAN

INTRODUCTION

A fire history and other studies (Allen 1989; Caprio et al. 1989; Touchan and Swetnam 1991, 1992) indicate that land use patterns from the 1890's forward, combined with a policy of total fire suppression beginning in the 1910's, amounted to an alteration of ecosystems unparalleled in the human history of this area. These changes in vegetation stand densities created conditions which led to two destructive crownfires affecting the park: the La Mesa Fire of 1977 and the more recent Dome Fire of 1996.

The Bandelier Resource Management Plan (1995) states as one park natural resource management objective to "restore and sustain natural ecosystem conditions and processes unimpaired from human influence, to the degree practicable given landscape and cultural resource constraints". The Environmental Assessment which supports this FONSI describes the following strategies (action objectives) to accomplish the resource objective stated above:

1. To allow prescribed natural fires to function in fire-dependent ecosystems.
2. To use fire to meet management objectives.
3. To protect life, property, and park resources from the effects of unwanted fire.
4. To prevent adverse impacts from fire suppression.

A revised Fire Management Plan (draft, 1996) outlines a total program designed to address these action objectives, consistent with meeting the requirements of the National Environmental Policy Act, other applicable federal laws, and NPS policies.

SUMMARY OF INTERDISCIPLINARY AND ENVIRONMENTAL REVIEW

Public involvement began with the issuance of an Environmental Assessment (EA) for the Fire Management Plan, Bandelier National Monument, New Mexico on August 4, 1995. The draft EA was distributed to known interested groups and individuals, other Federal agencies, media, and public libraries of Los Alamos and White Rock.

The draft EA was on public review from August 4, 1995 to September 4, 1995. The EA analyzed the various impacts of the

alternatives, including a no action alternative. It included the impacts on natural resources, cultural resources, and wilderness and scenic values.

However, due to extenuating circumstances, the review process was delayed. The park became involved in lengthy informal consultations with the U.S. Fish and Wildlife Service on the subject of spotted owl management in relation to prescribed fire. The results of these consultations are summarized in this document; however, the park is still negotiating the change of several requirements imposed by the Recovery Plan for the spotted owl. Therefore, this decision document is viewed as an interim action plan until these differences can be resolved.

The Dome wildfire of 1996 also impacted severely on park staff, resulting in a chain of unavoidable delays in final preparation of this FONSI.

Members of the public who responded to the request for comments on the Environmental Assessment supported the alternative B, which expands the management-ignited prescribed fire program and implements a prescribed natural fire program under the revised Fire Management Plan. Two written comment letters were received from individuals and one letter from another agency (see findings below). Both letters from individuals supported the alternative described above.

The U.S. Fish and Wildlife Service has reviewed the Biological Assessment and EA. By letter dated December 4, 1995, they concluded that implementation of [the PNF portion of] the preferred alternative is supported. However, subject to issuance of a "no affect" biological opinion for the MIPF portion of the preferred alternative, Bandelier will continue to follow the general guidelines of the Recovery Plan for the Mexican spotted owl (USFWS, 1995). These will consist of (1) Monitoring for owl presence within proposed fire treatment units during nesting season; and (2) where owl presence has been confirmed in these units, restricting fire treatments to the non-nesting season.

The aggregated comments from the responses are presented in Appendix 1 to this FONSI along with the NPS response to each comment.

ALTERNATIVES CONSIDERED

A. No Action: The consequences of no action are a continued program of small prescribed burns within the context of the existing Fire Management Plan.

B. Expand Management-Ignited Prescribed Fire Program and Implement A Prescribed Natural Fire Program Under Revised Fire Management Plan: (Preferred Alternative). The expanded program

under this alternative would begin to restore fire's role to a largely fire-dependent ecosystem according to the resource objective stated in the Introduction.

C. Mechanical Reduction of Hazard Fuels in the Pinyon-juniper Woodland and Mixed Conifer: Implementation of this alternative would serve to compliment alternative B, in that management would be afforded this option for situations in which fire treatment is not appropriate. This will be further discussed below under "Decision".

DECISION

The National Park Service selects Alternative B (Expand Management-Ignited Prescribed Fire Program and Implement A Prescribed Natural Fire Program Under Revised Fire Management Plan), and Alternative C (Mechanical Reduction of Hazard Fuels in the Pinyon-juniper Woodland and Mixed Conifer).

Constraints:

1. Monitor all proposed management-ignited prescribed fire units for nesting Mexican spotted owl presence during nesting season; avoid treatment until non-nesting season if presence is confirmed. Continue this procedure until such time as the U.S. Fish & Wildlife Service issues a "no effect" biological opinion for the MIPF portion of the selected alternative.
2. Limit mechanical reduction work to areas where forest structure has been altered or where cultural resources/developed areas may be adversely affected from fire:
 - montane meadows, where in most cases the application of fire has little or no affect on trees invading these grasslands;
 - within altered forest structure, where the application of fire will not meet reduction objectives;
 - within and around cultural sites, where woody removal reduces potential exposure to high levels of heating;
 - in and around park structures and improvements, where exposure to fire may result in damage or loss.

Some of the work required in the pinyon-juniper woodland is within designated wilderness, subject to minimum-tool and vehicle access constraints.

Conclusion

Implementation of Alternatives B and C, expand the management-ignited prescribed fire program, implement a prescribed natural fire program and employ mechanical fuel reduction of hazard fuels in the pinyon-juniper woodland and mixed conifer is expected to result in only positive impacts to the environment.

Any negative environmental impacts that could occur would be minor and temporary in effect. There are no unmitigated adverse impacts on public health, public safety, threatened or endangered species, sites or historic districts listed in or eligible for listing in the National Register of Historic Places, known ethnographic resources, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection laws.

Based on a review of the *Environmental Assessment for the Fire Management Plan, Bandelier National Monument, New Mexico*, interdisciplinary in-house staff participation, consultation with cooperating and other agencies, and public comments, that implementation of Alternative B and Alternative C does not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, in accordance with the National Environmental Policy Act of 1969 and regulations of the Council on Environmental Quality (40CFR 1508.9) an Environmental Impact Statement will not be prepared.

Recommended By:

Superintendent
Bandelier National Monument

Approved By:

Field Director
Intermountain Field Area

APPENDIX A

Topical Summary of Public Concerns and NPS response:

Of the three individuals and organization who submitted written comments, the following represents their input according to topic, and National Park Service response:

1. One respondent stated some concern that "landscape level, extensive (vs. intense) fires probably...[were] much less frequent...than [they are currently]..."

(The reference to possible impacts to Mexican spotted owl (Strix occidentalis lucida) habitat from prescribed natural fires.)

Based on completed fire research by Allen (1989), Touchan & Swetnam (1992, 1995), the number and frequency of watershed-scale fires was much higher in the last century than any time period in this century. More recently, Touchan & Swetnam (1995) and Allen, et al. (1995) document frequent mountain-range-wide fires in the last century prior to human suppression. Mexican spotted owl habitat and prey base have likely been severely altered by the absence of the large, ecologically significant fires. The proposed alternative should have an overall beneficial affect on this species, in part due to the expanded treatment areas and variations in intensities that will occur.

2. The same respondent (as in no. 1 above) recommended leaving some areas untreated (ie, not "...subjected to management-ignited prescribed fires to promote habitat diversity...").

This recommendation is not acceptable since fires are a natural process critical to healthy, sustainable ecosystems. Excluding fire imposes an unnatural condition that reduces habitat diversity and promotes the probability of stand-replacing wildfires. The proposed treatment schedule (MIPF) significantly reduces this risk and reintroduces habitat diversity through creation of plant and animal community mosaics (i.e., treatment areas do not burn uniformly; they leave a "mosaic"). Thus, the goal is to begin applying the (approximate 10-yr. fire return cycle) to all potential habitat.

3. Another comment by this respondent states that "...the effects of prescribed natural fire to the prey base within owl territories should be investigated and monitored."

The National Park Service will continue to monitor and evaluate the impacts of (all) fire management strategies on park ecosystems through an established monitoring program. Components may include fire effects on plant diversity and cover, responses

of certain indicator animal species (as funding permits) such as spotted owl, etc. As additional funds become available, specific investigations, including the impact of fires on the spotted owl prey base will be instituted through in-house and consultant expertise, and resident staff from the Biological Resources Division, U.S. Geological Survey. The (respondent) will be invited to review and participate in the on-going (since 1992 and as funding allows) long-term monitoring of fire effects, particularly as they relate to sensitive species. In any case, the park will comply with guidelines specified in the U.S. Fish and Wildlife Service's Recovery Plan for the spotted owl.

4. One individual respondent commented on shortening the time between first and second (MIPF) treatments.

The National Park Service is very interested in employing this approach; however, as long as there are high priority untreated areas remaining, second entries will be accomplished only as funding and resources will allow. The Bandelier ten-year management-ignited prescribed fire schedule attempts to mimic this return interval to the extent possible.

5. One respondent commented on the issue of cutting trees on montane grasslands, the goal being the creation of the healthiest forest/grassland mix under current conditions to ensure wisest use of limited resources.

The ultimate goal and a high park priority is to ensure that montane grassland communities remain as the predominate vegetative cover on areas such as Cerro Grande. The intent is not clearcutting the invading trees, but to reduce the canopy to a more optimum level and use fire to reduce resulting ground litter which impedes maintenance of healthy herbaceous cover.

6. A respondent commented on achieving regulatory balance and continue the public awareness program for fire management.

With respect to the public awareness program, Bandelier National Monument continues to actively utilize the media along with offsite and onsite interpretive channels to promote public understanding and support for the fire program.

APPENDIX B

REFERENCES CITED

- Allen, C.D. 1989. Changes in the landscape of the Jemez Mountains, New Mexico. Ph.D. dissertation, University of California, Berkeley. 346 pp.
- Caprio, A.C., C.M. Baisan, P.W. Brown, and T.W. Swetnam. 1988. Fire scar dates from Bandelier National Monument, New Mexico. Unpublished report on file at Bandelier National Monument, New Mexico. 49 pp.
- NPS, 1995. Bandelier National Monument Resource Management Plan.
- NPS, 1995. Environmental Assessment, Fire Management Plan.
- NPS, 1996. Fire Management Plan, Bandelier National Monument. Draft, 10,000+ pp.
- Touchan, R., and T.W. Swetnam. 1992. Fire History of the Jemez Mountains: Fire Scar Chronologies from Five Locations. Unpublished final report on file at Bandelier National Monument, New Mexico. 22 pp.

FINDING OF NO SIGNIFICANT IMPACT
FOR THE
FIRE MANAGEMENT PLAN

Executive Summary

The revised Fire Management Plan, Bandelier National Monument, outlines a total fire program including suppression, expanding management-ignited prescribed and implementing a prescribed natural fire program.

The EA describes three alternatives designed to accomplish the resource objective of restoring and sustaining natural ecosystem conditions and processes, unimpaired from human influence, to the degree practicable given landscape and cultural resource constraints. They are:

- A. No Action. Continue limited prescribed burns under the existing Fire Management Plan.
- B. Expand Management-ignited Prescribed Fire Program and Implement a Prescribed Natural Fire Program Under Revised Fire Management Plan.
- C. Mechanical Reduction of Hazard Fuels in the Pinon-juniper Woodland and Mixed Conifer. This alternative would serve to compliment Alternative A, under conditions in which fire use would not be appropriate.

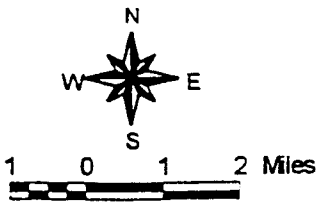
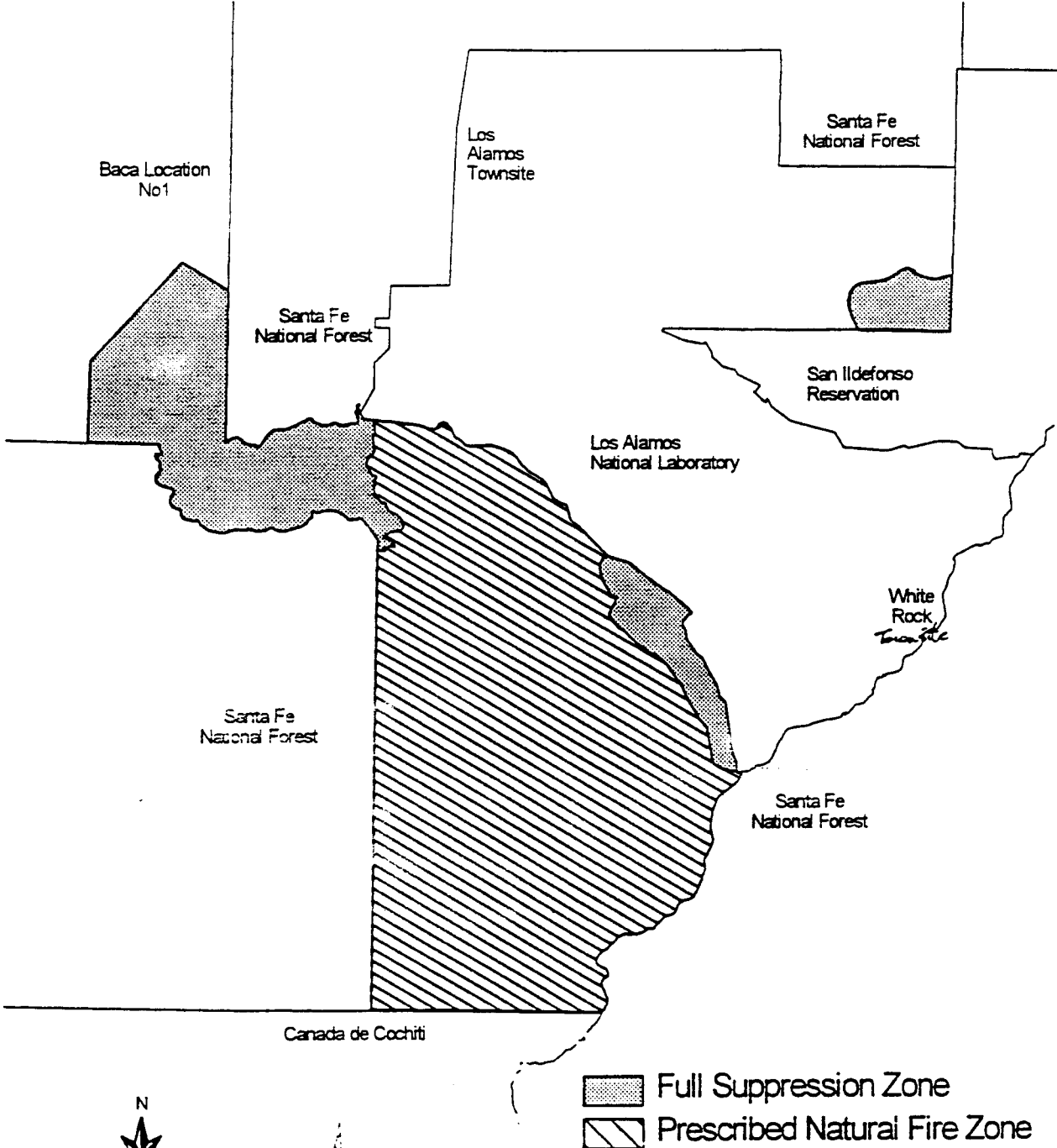
The selected alternatives are Alternative B and Alternative C, given constraints of:

(1) **Interim action:** monitoring for nesting Mexican spotted owls in proposed burn units; if confirmed, treat with fire during the non-nesting season until USF&WS issues a "no effect" biological opinion for management-ignited prescribed fires;

(2) limit mechanical fuel reduction to areas altered by human activity and cultural sites/developed areas, in cases where fire is not a prudent management option.

APPENDIX E. Fire Management Zone Map

Fire Management Zones Bandelier National Monument



H. Prescribed Fire Documents

1. Compliance Procedures, State Air Quality Regulations for Prescribed Fires, Prescribed Natural Fires and Wildfires

- a. Develop the Prescribed Burn Plan, including compliance documentation. Complete the Annual Prescribed Burn Application, including Unit No., location, duration, arcs, and potential smoke impact. Submit to New Mexico State EID, Air Quality Bureau, Compliance Section (See New Mexico Smoke Management Plan).
- b. Obtain weather forecast beginning approximately 10 days prior to proposed burn day; update forecast daily until 3 days prior to burn day. Perform fuels inventory to determine loading by tons/acre; read on-site weather and fuel moisture (10-hr TL) sticks daily 5 days prior to planned ignition date.
- c. Perform SASEM calculations; determine Miller-Holzworth Mixing Height; determine ventilation index and airmass stability.
- d. Receive Burn Permit from New Mexico State EID; perform any required mitigation specified, and contact EID as necessary.
- e. Submit burn plan to Superintendent (through Chief, RM) for signatures.
- f. Do final preparatory work on burn site; continue weather monitoring and run final fire behavior and ventilation calculations, burn day minus 3.
- g. Receive approved Burn Plan from Superintendent.
- h. Burn day minus one, begin notifications to agencies, media, etc. according to prepared list. Include State EID, compliance section and invitation to visit during burn day.
- i. Burn day: obtain final spot forecast, verify prescription is met, conduct briefing for all assigned resources, assure public safety and smoke management guidelines are being implemented; ignite the burn and monitor required fire behavior elements for verification. If indicated, video-tape the burn for record purposes.
- j. Conduct post-burn evaluation of prescription elements, ventilation and visibility affected. Adjust burn prescription accordingly.

2. FSA (Parts I & II) and PNF Decision Record

See following pages.

NATIONAL PARK SERVICE
FIRE SITUATION ANALYSIS
PART I. CURRENT FIRE SITUATION

1. FIRE # & NAME _____ NPS UNIT _____ CAUSE _____
- 1a) DATE: ____/____/____ 1b) MONITORED air, lookout, at scene? (circle one)
2. FBWS: _____
 Lead
 FBWS: _____
 Trainee
3. 3a) FIRE SIZE _____ 3b) DATE _____ TIME _____
 3c) ELEVATIONAL RANGE _____ 3d) T _____ R _____ Section(s) _____
4. VEGETATION TYPE _____% 4a) FUEL MODEL _____%
 (of area burned) (of area burned)
 _____% _____%
 _____% _____%
5. MAP--ATTACH!!! (Indicate fire perimeter and fuel models in the area; also indicate points where weather/fire behavior readings were taken and use a large arrow to indicate where the daily fastest rate of spread (recorded in 6c--below) was observed).
6. FIRE ACTIVITY
- 6a) Relative Intensity:

- 6b) Daily Rate of Fire Growth: _____ acres/day
- 6c) Daily Fastest ROS: _____ Direction--H, B, or F (circle one)
 Fuel Model _____ Compass direction _____
7. PROJECTED FIRE ACTIVITY
- 7a) Fire Behavior (NFFL) Fuel Model(s) in Direction of Spread:

7 b) Factors that Affect Fire Spread: _____

7 c) Forecasted Weather (1-5 days, specify number of days): attach forecast forms. _____

7 d) Predicted Fire Behavior (specify number of days): _____

8. THREATS/CONSTRAINTS

8 a) Life or Property: _____

8 b) Natural Resources: _____

8 c) Cultural Resources: _____

8 d) Management Boundaries: _____

8 e) Threats to Exceed Prescription: _____

9. Smoke Movement: _____

10. FIRE MONITORS' (FIRE BEHAVIOR/WEATHER SPECIALIST)
RECOMMENDATIONS

10a) Closures/Evacuations: _____

10b) Holding Actions: _____

10c) Monitoring Frequency: _____

11. SPECIAL CONCERNS OR COMMENTS: _____

12. NARRATIVE (OPTIONAL) Use back of page

Attach prescribed natural fire data sheet (page 4), photographic log, and weather forecast.

13. PREPARED BY: _____ Date: _____ Time: _____
Lead FBWS

_____ Date: _____ Time: _____
Trainee FBWS

NO CHANGE: _____ Date: _____ Time: _____
Lead FBWS

14. MANAGEMENT ACTIONS: (if applicable) _____

REVIEWED BY: _____ Date: _____ Time: _____
PFM/PBB/FMO

SUPPRESSION RESOURCES ASSESSMENT _____

15. Nearest Available ICT4/ICT3: Name _____

Home Phone _____ Work Phone _____ On Paid Standby? Yes / No (circle)

16. PRESCRIBED NATURAL FIRE DATA SHEET

FIRE # & NAME _____
0600 0800 1000 1200 1400* 1600 1800 2000

PARK PNF Rx
by FUEL MODEL
FM | FM | FM

Date _____

Time _____

Location _____

Aspect _____

Slope _____

WEATHER

Temp. _____

R.H. _____

Mid W.S. _____

Wind Dir. _____

Shading _____

FUEL MOISTURE

1 hr. _____

10 hr. _____

100 hr. _____

Live _____

FIRE BEHAVIOR

Model _____

Direction _____

Obs. ROS _____

Pre. ROS _____

Obs. FL _____

Pre. FL _____

H/A _____

FI _____

Drought Indices (BI, ERC, KBDI, 1000 hr, etc.) _____

PART II

Park _____ Fire #/Name _____ Date _____

17. Fire Situation (Including multiple fire problems): _____

18. ALTERNATIVE ACTIONS:

HOLDING ACTIONS

A. (No Action) _____

B. _____

C. _____

FURTHER ALTERNATIVES MAY BE ADDED, if necessary: _____

SUPPRESSION ALTERNATIVE ACTIONS:

Alternative __ . .

Alternative __ .

Alternative __ .

Alternative __ .

FURTHER ALTERNATIVES MAY BE ADDED, if necessary: _____

19. DECISION MATRIX

Impacts On:	Alternative ____ (No Action)	Alternative ____	Alternative ____
Soil			
Air			
Water			
T & E Species			
Vegetation			
Developments			
Recreation			
Wilderness			
Firefighter Safety			
Public Safety			
Cultural			
Adjacent Landowners			
Wildlife			
Other			

20. Management Constraints From Fire Management Plan:

21. Projected Containment/Suppression Needs/Costs:

Alternative _____		Alternative _____		Alternative _____	
Item	Cost	Item	Cost	Item	Cost

TOTAL COST _____

Alternative: - _____

Est. Completion Time (days) _____

Est. Fire Size at Project Completion (acres) _____

Remaining Uncontained Perimeter (%) _____

22. Preferred Alternative and Rationale: _____

Attach map of fire for each alternative.

23. Prepared by: _____ Date: _____
Signature: _____ Date: _____
Title: _____
Reviewed by: _____ Date: _____
Title: _____
Reviewed by: _____ Date: _____
Title: _____

Approved by: _____ Date _____
Superintendent

FIRE SITUATION ANALYSIS

The fire situation analysis (FSA) is standardized for National Park Service use and has been broken into Parts I and II. Part I, which is prepared by a FBWS I/II, is designed for use in routine monitoring of prescribed natural fires. It documents the daily fire situation, makes forecasts for upcoming fire activity, and documents that the daily fire situation does not exceed that which has been specifically approved by the Superintendent in the fire management plan. Part II, which will be prepared jointly by the FBWS and/or the PFM/PBB/FMO and other tactical experts as needed, will be prepared along with Part I at the beginning of a PNF and thereafter when a new threat or constraint, referenced in 8a-8e Part I is identified, or when increased holding actions in 10b are indicated; or when the fire management plan and progress of the fire or other situations develop which indicate that a different management strategy is appropriate.

Parts I and II are initially approved by the Superintendent in order to declare that a new fire is to be managed as a PNF. Thereafter, Part I is prepared by an experienced PFM/PBB or FMO specified by NPS policy. This individual then completes and signs block 14 of the FSA, part I, specifying all management actions taken during the last burning period and actions to be taken during the next burning period in order to comply with the park's fire management plan. The recommendation of whether or not to carry the PNF into the next burning period as a PNF or to activate Part II of the FSA is documented and approved on the NPS-PNF Decision Record. This record remains on the Superintendent's desk throughout the PNF season and is updated daily by the FMO. Part II is always approved by the Superintendent on the document itself, since Part II legally documents a change in management strategy.

Should additional space be required for any FSA inputs, the back side of each page should be used for continuation.

INSTRUCTIONS FOR PART I (CURRENT FIRE SITUATION)

Part I is a very important management tool. Its usefulness depends on the quality of work by the fire monitor (fire behavior/weather specialist). The information collected and compiled provides the key link between the fire and management actions. It is easy to misinterpret the intent of a simple category title; take the time to read these instructions carefully so that management (at all levels) will receive the complete picture. Turn the page over and write on the back if the space provided for any particular element is inadequate. Do not lump two or three days of information onto one form. If any entry on this FSA does not apply to the fire being analyzed, place an NA in the appropriate blank space; this will ensure that all elements of this document are considered.

1. FIRE # & NAME, NPS Unit, and monitoring method are self-explanatory. Fill in the date of the reconnaissance/report. Cause of ignition: lightning, natural, unknown, human.
2. Write in the name of the Fire Behavior Weather Specialist (FBWS) and the assigned trainee. The lead monitor must be at least a fully qualified FBWS II. The trainee monitor must have successfully completed the training course prerequisites and may use this assignment to fulfill the job experience prerequisites.

3. 3a--FIRE SIZE - Calculate in acres using a dot grid, perimeter tables, etc.
3b--Enter the date and time when the fire size was determined.
3c--Enter the highest and lowest elevations at which the fire has burned.
3d--Give legals: T (township); R (range); and Sections.
4. VEGETATION/FUEL TYPES - Identify for area burned. Use a conventional identification system (i.e., NFFL or NFDRS, etc.).
5. MAP - A map must be included with every submission of the FSA. Outline vegetation or fuel model areas both within and around the burn. Completely label and date every map. Use a large arrow to indicate where the fastest rate of spread was observed. Label location of fire weather/behavior data readings that are recorded on the Fire Data Sheet (page 4) with labels A, B, C, D, etc, on both the map and the data sheet.
6. FIRE ACTIVITY - The intent of this section is to summarize today's "observed" fire activity.
 - 6a--Relative Intensity - Use an adjective rating system; i.e., smoldering, creeping, running, torching, crowning, spotting. Describe for all fuel models present.
 - 6b--Daily Fire Growth - Calculate from fire position/time maps and/or by fire behavior system analysis, using observed weather data. This rate of growth should be expressed as acres/day.
 - 6c--Daily Fastest R.O.S. - Record the fastest rate of spread (linear) observed during the entire day's fire activity (chains/hour). Circle the direction of the fire spread (heading, backing, flanking). Also list the compass direction of spread; i.e., NS, S, NNE. Indicate the fuel model through which the fastest R.O.S. was observed.
7. PROJECTED FIRE ACTIVITY - The intent of this section is to have the fire monitor(s) observe and employ the key variables that influence fire behavior and to predict fire activity.
 - 7a--Fire Behavior System (NFFL) Fuel Models in Direction of Spread - Discuss the predicted fire activity in the various fuel models that are going to be involved as the fire spreads; this will require mapped locations of the fuel models present in all directions of fire spread.
 - 7b--Factors that Affect Fire Spread - Describe barriers and deterrents to fire spread, as well as factors that are likely to increase the spread; i.e., barren sites, fuel changes, local weather patterns, etc.
 - 7c--Forecasted Weather - Obtain long range (1-5 day) forecast, if possible. Specify the type of forecast received. Request spot weather forecasts for time periods of known or expected significant fire danger and for times of any locally observed changes in winds, etc. at the fire site which could increase fire activity. Attach the weather forecast form if received.
 - 7d--Predicted Fire Behavior - Predict fire activity for the next 1 to 5 days (specify the number of days), given current fire position and forecasted weather. Predict the acreage growth expected in the next 24 hours and display the expected growth and fire shape on the map.

8. **THREATS/CONSTRAINTS** - Address threats and constraints identified in the park's Fire Management Plan. Specify both potential and actual threats.

8a--Life or Property - Briefly describe threats to visitors as well as to fire monitors, firefighters, etc. Threats to consider are reduced visibility, location of roads, trails, ranger station buildings, local land ownership other than NPS, etc.

8b--Natural Resources - Briefly summarize threats to rare, threatened, or endangered species, scenic vistas, water quality, etc.

8c--Cultural Resources - Identify threats to cultural and/or archaeological resources. Indicate whether the persons responsible for protection/management have been notified.

8d--Management Boundaries - Describe the proximity of the fire to any management boundaries. Do not simply state that there is a boundary and then describe it; indicate how far the fire is from the boundary(ies) and anticipated arrival time, if any.

8e--Threats to Exceed Prescription - Parks must have specific prescriptions for prescribed natural fires. These are specified in the FMP and must contain fire condition indices and fire behavior parameters (ie; FL, ROS). Indicate if these are likely to be exceeded.

9. **SMOKE MOVEMENT** - Describe altitudes containing smoke, direction of smoke movement, relative density, color, presence of inversion and time of lifting (if it occurs). If a highly scenic or popular recreational area is being impacted, describe the time and extent of visibility reduction. Also estimate the smoke concentration and probable impacts on nearby towns, cities, or other important targets that are likely to be or are being affected by smoke.

10. **FIRE MONITORS (FIRE BEHAVIOR/WEATHER SPECIALIST) RECOMMENDATIONS**

10a--Closures/Evacuations - Advise on closures and/or evacuations; include trails, buildings, roads, recreation or wilderness areas, etc. Also recommend the need for safety signs.

10b--Holding Actions - If fire warrants a holding action to maintain the prescription, provide the justification based on the current situation and predicted fire behavior. Indicate the extent of the proposed action, i.e., natural barriers to be used, length of line to be used, etc.

10c--Monitoring Frequency - Indicate how often the fire should be monitored on site, given the current and projected conditions. Distinguish between air and ground reconnaissance frequency.

11. **SPECIAL CONCERNS OR COMMENTS** - Stress the points of concern in the Fire Situation Analysis that only ground monitoring can provide (ie; length of active fire perimeter, number of acres burned, erratic fire behavior, threats to safety, reduced visibility, future monitoring requirements, etc.). Suggested points to address are threats to safety, reduced visibility, future monitoring requirements, or specific local concerns such as land status, etc.

12. **NARRATIVE (OPTIONAL)** - Use the back of the page (or attach notes) to the FSA to record information that may be of interest and for which space has not been provided.

13. **SIGNATURES** - Both fire monitors (lead/trainee) contributing to the Part I analysis should sign, date, and time the submission. Refer to the NPS Prescribed Fire Qualifications System Flow Chart and job complexity analysis for appropriate staffing levels. A "no change" signature is optional and can be entered by the lead monitor when and if there are no significant changes in items 6-11 of Part I from the previous day's activities; the use of this signature block eliminates the need for duplication associated with the completion of this document.

14. The PFM/PBB/FMO has the responsibility for ensuring that the FSA is properly completed each day and must sign that it has been reviewed and is recommended for approval. The line officer is the Superintendent who has the ultimate responsibility for authorizing the appropriate action(s) based upon Part I submissions, including a daily assessment of available suppression resources. The Superintendent signifies acceptance and approval by signing the Daily Decision Record (NPS Form #___).

15. The FMO is responsible for designating a ICSR or ICMR, whichever is most appropriate, to each PNF for contingency actions. A copy of the FSA Part I (and Part II if changed) should be sent to the incident commander (IC) designate daily and, if necessary, this individual can be placed on paid standby. Ideally the designate IC can and should be the PFM OR PBB if s/he is qualified for the IC job function.

16. A Prescribed Natural Fire Data Sheet (page 4) should be included with all "at scene" reconnaissance reports. The hours listed across the top of the form are only suggested data collection times. The actual frequency is dependent upon the fire and information requirements of the NPS unit. Actual monitoring time for each data collection point is recorded after the date. The * at 1400 hours indicates the recommended time (depending on a unit's time zone and specific needs) at which FSA data should be called into Fire Dispatch or to the park "Fire Contact". It is a critical fire data collection time.

Location identifiers (use letters to identify points) on the data sheet; make sure these data labels correspond with points identified on the map.

The data sheet has space for listing prescription elements. Include park-specific PNF prescription(s) for as many fuel models as applicable; three prescriptions can be listed in the space provided below the fuel model numbers (Fire Behavior System-NFFL).

A photographic log may be required in some situations.

INSTRUCTIONS FOR PART II- (HOLDING/SUPPRESSION CONSIDERATIONS)

17. **FIRE SITUATION** - Briefly describe the single or multiple fire problems, smoke problems, fire load or other situations. Discuss the availability of suppression forces, if they are indicated as needed, and their location if known.

18. **ALTERNATIVE ACTIONS** - Describe the holding and/or fire suppression alternatives which may be used to manage the fire situation. This discussion can include no actions needed, specified holding actions, or a combination of control, confine, contain strategies if suppression is called for. Any of these may involve only a portion of the fire perimeter.

19. **DECISION MATRIX** - A narrative analysis of the effects of each alternative management action on park values. In essence, you are analyzing the effect of the action and not the effect of the fire. Address only those values which are critical to the selection of a desired alternative. Be brief and to the point!!

20. **MANAGEMENT CONSTRAINTS** - Refer to the park Fire Management Plan for the general management constraints (e.g., public safety protection of features and resources, restoration of natural processes, etc.). These may be listed on a separate sheet or simply referenced to the park Fire Management Plan.

21. **PROJECTED HOLDING/SUPPRESSION NEEDS/COSTS** - Estimate needs and costs of the holding or suppression action (e.g., contain, confine, control) for each alternative. List by broad category, general considerations such as aircraft costs, personal services, major equipment acquisition, etc.

22. **PREFERRED ALTERNATIVE AND RATIONALE** - The selection of the preferred alternative will be based upon a relative weighting of management constraints from the fire plan and the impacts of the various alternatives. The objective of this process is to manage the fire problem with the least impact on park natural and cultural resources. This determination requires those responsible for making such decisions to undertake and document a project review similar to that required under NEPA.

23. **Signature(s)** - of PFM or PBB and others who prepared the FSA.

Reviewed - signature of any designate discussed in fire management plan.

Approval-the Superintendent must sign the FSA Part II each time it is changed to reflect new management strategy.

NPS-PNF DECISION RECORD--INSTRUCTIONS

Directions: This form must be updated daily and signed by the Superintendent or acting Superintendent when there are any ongoing prescribed natural fires in the park. It is intended to provide management with a status report of all active PNFs being managed daily via Part I of the Fire Situation Analysis. Significant changes in management strategy of a PNF are reflected in Part II of the FSA which must be signed by the Superintendent on the FSA document itself. Management of wildfires is done via an approved EFSA.

Status must be indicated as: prescribed natural fire (PNF), wildfire (WF), out (O). If a fire has been declared a wildfire, it may be removed from the list if desired after being noted for one day. PNFs that have gone out may be removed from the list if desired after being noted for one day.

Based upon existing and forecasted fire weather, all the fires listed except those noted as wildfires are anticipated to remain within prescription in the forecast period of 24 hours. Local or regional personnel and resources are available to monitor the fires or suppress those fires which may exceed prescription, in accordance with the guidelines for fire suppression found in the area Fire Management Plan.

June 1990

Release Number 3

3. Instructions for Completing the Prescribed Fire Unit Plan

See the following pages.

**Interagency
Prescribed Natural Fire
Burn Plan**

1. General Information (location map, fuel types, etc.,)

The intent of this section is to provide simple applicable information about the location within the management unit and information related to the ignition point and area where the fire is expected to burn.

2. Fire Projections (expected and severe weather events)

Some form of analysis is needed to project fire size over time, whether it is FARSITE, RERAP, BEHAVE or other newer technology as it becomes available.

3. Identification of Maximum Manageable Area (MMA)

The identification of the maximum manageable area should include input from staff specialists as applicable. With larger fires that are expected to cover large areas it is recommended that an interdisciplinary approach be taken, so that appropriate interests are represented and concerns are known. As each interest identifies its concerns a compromise is reached where all disciplines can eventually agree to the area where the fire will spread. For areas where rapid fire growth is the norm, and duration may be short, these areas may need to be established before the ignitions.

4. Narrative risk assessment which may consider the following items:

Within this section there should be a list of items that the management unit must consider when authorizing a natural fire that may burn for many days or months. The list can be extensive or less so, depending on the management unit, the fire, but should include some of the following:

- firefighter safety
- fire behavior
- fire history
- threat to life and property
- smoke management concerns and dispersion corridors
- resources available for current and expected needs
- effects on visitors, users, cooperators, local communities, etc...
- consideration of effect on other fire management activities
- weather/season/drought prognosis
- significant natural/cultural resource considerations

5. Monitoring Actions

The intent of this topic is to determine the intensity of monitoring needed and the time frame with which the fire is observed. This may also document when and why a fire will go from aerial reconnaissance to on the ground monitoring teams.

6. Holding Actions

This section may act as a place to identify known holding actions that may be expected. If a weak section on the MMA will require line construction and burning out, and the mop-up and patrol, it should be mentioned here with a plan as to how and when this may be done. When executing these actions, it is recommended that clear direction and an action plan be developed to guide the tactical deployment of personnel needed to accomplish the objectives of the holding action.

7. Estimates of qualified resource needs to manage the fire

Describe the number, type, and qualifications of fire management resources (overhead, crews, engines, helicopters, etc) which will be needed to implement the monitoring and holding.

8. Cost estimate to manage the fire/Are adequate funds available?

Calculate a total cost estimate for the managing of the PNF, separating costs for planning, monitoring, holding and evaluation.

9. Contingency actions

Describe the conditions which would result in conversion of the PNF to a wildfire, which may include exceedance of prescription parameters or escape of the fire beyond the MMA. Specify that the EFSA will be prepared which will evaluate a series of suppression options under an appropriate suppression response. Describe who would assume command of the wildfire. Describe how the resources assigned to the PNF would be organized to support the suppression effort.

10. Information plan

Describe the provisions to keep the public, cooperators, users, and internal personnel informed of the PNF and its subsequent growth.

11. Decision criteria for routine revalidation

Describe the process and criteria by which the PNF is evaluated to determine if the fire is still burning within prescription parameters and is predicted to remain so for the next 24 hours.

12. Evaluation Process

Describe how the fire will be evaluated from both a managerial and resource effect perspective. This may include financial, operational, ecological or similar type assessments.

13. Summary statement

Describe the relationship of the risk assessment and fire projections to the implementation actions and MMA. This summary statement combines the elements of the PNF Burn Plan and provides a rationale for establishing the MMA based on mitigation of identified risks.

14. Required Signatures

**INTERAGENCY
PRESCRIBED NATURAL FIRE
BURN PLAN**

1. General Information

ADMINISTRATIVE UNIT: _____

FIRE NAME: _____ ADMINISTRATIVE#: _____

START DATE/TIME: _____ DISCOVERY DATE/TIME: _____

PRESENT SIZE: _____

Location

Legal/lat/long//UTM: _____

Geographical Location: _____

Fuel Model: _____

Vegetation Type: _____

Slope: _____ Aspect: _____ Elevation: _____

2. Fire Projections and Map:

Projected fire area under expected weather conditions: _____ acres on: _____

Projected fire area under severe weather conditions: _____ acres on: _____

3. Maximum Manageable Area (MMA). See attached map _____ acres.

4. Risk Assessment Considerations

a. Threat to MMA boundary

b. Threat to public use and firefighter safety

c. Significant natural/cultural resource considerations

d. Smoke dispersion and effects

e. Weather/season/drought prognosis

f. Other

MANAGEMENT IGNITED PRESCRIBED FIRE NOTIFICATION LIST

E-mail via Ccmail as many of these people or agencies as possible. It can be done as a group mailing, and is far more efficient.

- a. USFS dispatch, Santa Fe NF 438-7800
FAX map daily. 438-7875
- b. Ben Jacobs, PFSM Coordinator, Boise.(208) 387-5219
- c. System Support Office (Ben Espinoza) 988-6113
- d. Regional FMO (Dan O'Brien). (303) 969-2449
FAX (303) 969-2037
- e. Los Alamos Police Department 662-8222
- f. Los Alamos County Fire Department (Station 7) 667-7030
- g. Los Alamos Emergency Coordination Center. 667-7080
Ed Nettles, FAX:. 667-7770
REQUEST THAT THEY NOTIFY OTHER LANL DIVISION AND
TEAMS!
- h. Entrance Station 672-1004
- i. Visitor Center 672-3861 x 517
- j. BIA, 8 Northern Pueblos (Jerome Jenkins) 1-505-753-1455
- k. Bernalillo, State Forestry (Kim Kostelnick) 1-505-867-2334
- l. State Police 827-9126
- m. Santa Fe New Mexican 986-3030
- n. LANL Security 667-4437
- o. Los Alamos Monitor 662-4185
- p. New Mexico Air Quality (Filiberto Dominquez). 827-1494 x 1507
- q. Radio KRSN 662-4342
- r. Baca Land & Cattle. 662-9520 or 662-9513

4. Burn Evaluation Summary, Management-Ignited Prescribed Fire

Burn Unit _____ Size _____ Date(s) of Burn _____

GOALS: _____

BURN OBJECTIVES:	PREDICTED (PREBURN)	ACTUAL (POST)	MET?
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

PRESCRIPTION:

temperature _____
rel. humidity _____
wind direction _____
wind speed _____
fuel moist 1hr _____
 10hr _____
 100hr _____
 1000hr _____
 woody _____
 herb _____
rate of spread _____
flame length _____
scorch height _____
burn severity _____

COSTS:

planning _____
preparation _____
burning _____
holding _____
mopup/patrol _____
monitoring _____
evaluation _____
cost/acre _____

MONITORING AND EVALUATION METHODS:

fuel inventory _____
tree change _____
shrub change _____
grass change _____
herb change _____
burn severity _____
scorch height _____
weather _____
fire behavior _____

GENERAL OBSERVATIONS (POSTBURN NARRATIVE)

RECOMMENDATIONS

I. Prescriptions

1. Management Ignited Prescribed Fire.

HEAD FIRES				
FUEL MODELS ¹	2	8	9	10
Vegetation	Montane Grasslands	Mixed (MC) Conifer	Ponderosa Pine Piñon-juniper Woodland	MC
Air Temperature (°F)	35-75	40-75	40-80	35-75
Relative Humidity (%)	10-30	12-35	12-35	12-35
Wind Speed (mph, eye-level)	0-15 2-10	0-10 2-10	0-10 2-10	0-8 2-10
1 hr. TL Fuel Moisture	6-10	5-10	5-12	6-12
10 hr. TL Fuel Moisture	5-60	-	-	5-60
Live Fuel Moisture				
Rate of Spread (ch/hr)	2-120	1-10	2-30	2-10
Heat/Unit Area (BTU/ft ²)	80-100	200-700	200-700	220-700
Flame Length (ft)	1-6	1-6	1-8	1-6
BACKING FIRES				
FUEL MODELS ¹	2	8	9	10
Air Temperature (°F)	40-80	45-75	40-85	40-75
Relative Humidity (%)	12-30	12-30	12-30	12-30
Wind Speed (mph, eye-level)	0-8 2-10	0-8 2-10	0-8 2-10	0-8 2-10
1 hr. TL Fuel Moisture	4-10	4-10	4-10	4-10
10 hr. TL Fuel Moisture	-	6-20	6-20	06-20
1000 hr. TL Fuel Moisture	8-18	8-18	8-18	8-18
Rate of Spread (ch/hr)	0.5-3	0.5-2	0.5-2	0.5-2
Heat/Unit Area (BTU/ft ²)	400-600	300-800	300-750	350-800
Flame Length (ft)	0.5-2	1-3	1-3	1-3.5

¹National Forest, Fire Laboratory, Missoula, Montana.

2. Prescribed Natural Fire

The following prescription applies to natural ignitions approved for PNF status in the Bandelier Prescribed Natural Fire Management Zone.

NFDRS Fuel Model: C (Weather Station: Tower 290801)
NFFL Fuel Models: 2/9

PRESCRIPTION (as of 06-30-97):

- 1) Three-day running mean ERC: <44; AND
- 2) Smoke dispersal is less than "good" for 3 or more days; OR
- 3) "Sustained" midflame wind speeds are in excess of 25 mph, except for PNFs located in the piñon-juniper zone where sustained wind speeds can exceed 50 mph if long-range spotting is not a problem.

NOTE: These prescription parameters may be refined based on new data and analytic tools (such as PCSEASON and RERAP). Modifications will be recorded directly on this page, date and signed by the FMO, Chief of Resource Management and park Superintendent.

J. Research and Monitoring Plan

See Fire Monitoring Handbook (on file).

FMH DATA ANALYSIS SUMMARY

Park: _____ Date: ____ / ____ / ____
Name: _____ Analyzer (RMS/FMO)

Briefly describe what management concerns prescribed fire will be used to treat:

References Used: _____

Resource Management/Burn Objectives:

(1) _____

-2 _____

(3) _____

References Used to Support Stated Objectives: _____

Monitoring Type (one only per data analysis): Burn / Control (Circle One)

Monitoring Type Code *Monitoring Type Name* *Plot Numbers*

Monitoring Type Variables:

Objective-dependent Variables:

(1) _____

(1) _____

(2) _____

(2) _____

(3) _____

(3) _____

(4) _____

(4) _____

Note: monitoring type and objective-dependent variables may be identical

Variables used for Analysis (options are listed on page 3):

Initial Interpretation of the Minimum Plot Calculation:

Actions to be Taken Based on this Data Analysis:

Additional Analyses Needed:

Initial Interpretation of the Data:

Were Objectives Met? (see page 1 for objectives—describe below in terms of the range of acceptability)

- (1) Y/N/Unk _____
- (2) Y/N/Unk _____
- (3) Y/N/Unk _____

Actions to be Taken Based on this Data Analysis:

Additional Analyses Needed:

COMPUTERIZED FMH DATA ANALYSIS OPTIONS

Herbaceous

transect hits (% frequency) by species
 % relative cover by species or substrate
 % native species
 % non-native species
 % perennial/annual native species
 % perennial/annual non-native species
 % dead perennials/annuals
 live or dead herbaceous plant height
 live or dead herbaceous plant density
 live or dead native herbaceous plant density
 live or dead non-native herbaceous plant density

Brush

brush density by species
 native brush density by species
 non-native brush density by species
 brush age by species
 native brush age by species
 non-native brush age by species
 brush density by age and species
 native brush density by age and species
 non-native brush density by age and species

Overstory Tree

live or dead overstory tree density by species
 live or dead overstory tree density by dbh
 live or dead overstory tree density by dbh and species

Pole-size Tree

live or dead pole tree density by species
 live or dead pole tree density by height
 live or dead pole tree density height and species

Seedling Tree

seedling tree density by species
 seedling tree density by height
 seedling tree density by height and species

Postburn

average scorch height
 average char height
 % of crown scorched
 average burn severity

Fuels

total fuel load	fuel load in 1-hr size class
duff fuel load	fuel load in 10-hr size class
duff depth	fuel load in 100-hr size class
litter depth	fuel load in 1000-hr size classes
total woody fuel load	fuel load in 3+S class or +R class

K. Line Officer's Documentation

1. Line Officer's Delegation of Authority and Direction to IC
2. Line Officer's Briefing Statement
3. Background Information on the monument
4. Guidelines for the Takeover and Release of Fire Teams
5. Escaped Fire Situations Analysis Format

See the following pages.

DELEGATION OF AUTHORITY

As Superintendent of Bandelier National Monument, I am delegating to you the authority to manage the suppression of the

_____ fire in accordance with the attached guidelines, priorities, and constraints.

This briefing paper will also provide you with an outline of monument resources available for assignment to your operation under specified conditions.

Upon the arrival of you and your team, myself or an appointed staff member, along with the local incident commander being relieved, will deliver a briefing for your team.

My goals and constraints for managing this incident are as follows:

1. No Dozers are allowed within the Bandelier Wilderness.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

Date Hour

Superintendent
Bandelier National Monument

Superintendent's Agency Representative to Incident Commander

The monument representative assigned to your team

is _____ and will have line authority for the monument Superintendent. The representative will be expected to attend all briefings and strategy sessions, and to assist with any problems that require the Superintendents's input.

Representative Office phone: _____

Home phone: _____

Administrative Title: _____

Red Card Qualifications: _____

Line Officer's Briefing Statement

- a. I will exercise my authority as Superintendent to close the monument to visitation if this fire threatens or has the potential to threaten developed areas or facilities.
- b. The incoming Incident Commander should contact the monument's Superintendent upon assignment, to arrange for the transportation needs of the team locally, to meet with expected monument support personnel, and to set a location and time of initial briefing upon arrival.
- c. Incident Commander can expect the following support from the monument prior to arrival:
 - (1) Orders for supplies and personnel as requested: placed through Santa Fe Zone.
 - (2) Organize initial incident base camp personnel to receive, store and secure incoming supplies.
 - (3) Provide pre-suppression maps and a supply of monument topos in the form of a kit.
 - (4) Order a NIFC radio cache as requested.
 - (5) Identify possible base camp location(s).
 - (6) Order transportation vehicles for team as requested.
 - (7) A prepared Escaped Fire Situation Analysis.

3. Background Information on the Monument

a. Protection Priorities

(1) Safety

- (a) Those in charge are responsible for the safety of personnel first, then for the job at hand. There are two aids to the safe fire operation, "Ten Standard Fire Fighting Orders" and "18 Situations that Shout Watch Out". All fire personnel are to be thoroughly familiar with these guides.
- (b) Observation of temperatures and drinking water requirements; rattlesnake presence in cool areas, rocky areas and near water sources; winding roads (New Mexico State Road 4 particularly), which means holding down speed to within posted limits; and bears which may present safety problems; steep and rocky canyon walls can cause problems with footing and rolling materials.
- (c) Residents of the monument should be given as much advance notification as possible, to effect orderly evacuation when fire threatens escape or direct involvement. Presently there are five housing areas inside the monument.
- (d) Visitors: Operations personnel must also face the possibility that park visitors may be ahead or upslope from a fire. A backcountry permit system may assist in determining the presence of campers, but day users are another problem. If the rate of spread is such as to constitute a threat, a helicopter with mounted public address system or message drop, or runners should be considered.
- (e) Temporary closure of the park or a portion of it should be exercised when large or erratically behaving fires are present. Where a fire threatens escape from the park, adjacent authorities should be given as much advance notice as possible, to effect orderly evacuation. The same would apply to notification of the Superintendent, FMO or Chief Ranger should any in-park developments be threatened.

(2) Developed Areas

- (a) Housing - There are three main areas in the Monument: Frijoles Canyon, Mesa-top area 1/4 mile northwest of the entrance station, and "Backgate" (6 miles northwest of the entrance station along State Road 4).

- (b) Facilities - Headquarters area and Visitor Center, in Frijoles Canyon is considered number one priority in facility protection. The Maintenance yard on the mesa top is primarily storage, and is located just south of the mesa housing area.
- (c) Campgrounds - Juniper Campground (over 90 sites) just north of the Mesa housing area is of secondary importance to housing and facilities: Ponderosa Campground at Backgate is also secondary.
- (d) Base Camp, Capulin Canyon - This two room log cabin is the backcountry ranger residence and fire cache, and should receive primary protection in this area of the Monument.

(3) Cultural Resources

- (a) These are what the Monument was established to preserve and protect. There are well over 2000 surveyed sites on the monument, with an estimated 2,000 sites as yet to be recorded. Many sites appear as "mounds" of rocks, generally on mesa tops. These unexcavated resources are irreplaceable and invaluable, and represent a culture of the 1100's to the 1500's.
- (b) The Frijoles Canyon Headquarters and Visitor Center complex (designated a Historic District) house historical and current records, artifacts, collections and displays which require protection and are of high priority. The ruins areas of Tyuonyi and Long House, northwest of the Visitor Center, are included in these priority areas.
- (c) Policy guidelines to follow in protection of park resources:
 - i) Bandelier National Monument has 23,267 acres designated by Congress as wilderness. Refer to Bandelier Wilderness Plan for guidelines on chainsaws and motorized equipment. The rules of selecting the minimum tool, including minimum suppression tactics, necessary to accomplish the job must be used. No dozers are allowed.
 - ii) Each piece of equipment will be attended by a qualified resource advisor (archaeologist or cultural resource person) who will identify features to be avoided. Yellow flagging will mark the sites.
 - iii) All fireline personnel will be briefed by the resource advisor before going on shift as to the significance and uniqueness of the monument,

cultural, and natural resource and how to have minimum impact on them during suppression work. Artifact collecting is prohibited.

- iv) Fireline construction will be restricted, as much as possible, to minimum disturbance to surface soil.
- v) Only fugitive dye-type retardants will be used.

(4) Natural Resources

- (a) Piñon-Juniper Association - Covers approximately the southern half of the monument. Fuels are light and discontinuous, due in part to over-grazing by ungulates including feral burros. Grasses in this area carry the fire primarily. Consider fuel Model C under NFDRS, NFFL Model 2.

Ponderosa Pine Association - Located in the mid elevational (6,000-8,000 feet) portion of the monument, and constitutes the transition zone. The area is characterized by a burn from the La Mesa fire of 1977, with heavy grass cover and some burned trees which have fallen over the years since the fire. Consider fuel Model U under NFDRS, NFFL Models 2, 9, 10. The major fire problem in this association is in the upper Capulin Canyon-Boundary Peak-Turkey Springs area, where fuel loads often exceed 20 tons per acre.

Mixed Conifer Association - Area consists of Douglas fir, Ponderosa pine and White Fir at 8,000 to 9,000 feet in elevation. This type merges with Spruce, fir and Aspen species above 8,500 feet. Fuel Model G under NFDRS, NFFL 10, and fuel loads of ten exceed 30 total down and dead tons per acre.

- (b) Water sources would include all canyon drainages, the spring at mouth of Frijoles Canyon, and Turkey Springs between Medio and Sanchez Canyons.
- (c) Air quality is important due to classification of Bandelier as a Class I airshed under the Clean Air Act and amendments of 1977.
- (d) Soil erosion is significant due to poor soil density.

b. Bandelier Fire Suppression Resources

(1) Equipment and tools

- (a) Headquarters Fire Cache (inventory on file in Fire Management Office)
- (b) In addition to one type 6 engine, there is one 150 gallon slip-on pumper unit available, as are two portable pumps. Water delivery equipment includes 2800 feet of 1/2 cotton hose and 2400 feet of one inch cotton hose and some hardware is available.

(2) Possible Fire Camp Locations

(a) Ponderosa Campground

Water available, one credit card telephone, and four chemical toilets now exist, power outlets limited, but available.

(b) TA-49

Permission to use this LANL facility should be made through the LANL Emergency Operations Center. The area is accessible through a secured gate across State Route 4 from the Bandelier Repeater site.

(3) Communications

Equipment includes a monument 60-watt base station and remote units in the Headquarters, Visitor Center, and Entrance Station. Three repeaters and one direct provide 4 operating park channels. All fire management radios are 210 channel programmable radios.

(4) Transportation

- (a) Certain monument vehicles may be made available for fire-related duty. Drivers will be monument personnel only, and will report to the Ground Support Unit.
- (b) Bandelier protection rangers will be available for traffic control and law enforcement as required. Fire traffic will be strictly controlled for vehicle speed and safety precautions.

(5) Personnel

There are approximately 10 to 15 certified (red-carded) fire personnel during any season. It is expected that these personnel be available for release from the incident in cases of emergency (initial attack, search and rescue, etc.), and when sufficient resources arrive for fire duty.

Upon request, you will be provided a list of monument fire-qualified personnel.

(6) Other Facilities and Resources

(a) Medical

- i) University of New Mexico Burn and Trauma Center-Albuquerque, 505-834-2231.
- ii) Los Alamos Medical Center, 662-4201
- iii) Los Alamos Fire Department has rescue and ambulance units. Dial 911 or 662-8301.

(b) Aircraft Facilities

- i) Los Alamos Airport, with a 5,240 foot runway; **Prior permission is required to land at airport.**
- ii) Santa Fe Airport, longest runway is 8,322 feet by 150 feet wide, paved, 473-7243.
- iii) For large helicopter operations, the nearby Technical Areas (TA-33 & TA-49) can accommodate four to six medium helicopters; need to clear with the Department of Energy/LANL Emergency Operations Center. Restricted airspace adjacent and north of the monument is controlled by the Department of Energy. Special clearance is required at Los Alamos Airport, 667-4521.
- iv) Fixed wing aircraft and helicopter support aircraft availability can be checked through Interagency Zone Dispatch, Santa Fe National Forest, Santa Fe, 438-7800.
- v) The Monument maintains a small paved helispot 1/2 mile northwest of the fire lookout, or one mile southeast of the Juniper campground, just off entrance road.

(c) Ground Equipment

Nurse tankers and engines available through Los Alamos County Fire Department, 667-7080.

4. Guidelines for the Takeover and Release of Fire Teams

See NPS-18, Fire Management Guideline.

5. Escaped Fire Situation Analysis Format

See the following pages.

This page is completed by the Agency Administrator.

Section I. EFSA Information Page

I. A. Jurisdiction(s): Assign the agency that has fire protection responsibility, e.g., USFWS, USFS, BLM, etc.

I. B. Geographic Area: Assign the recognized "Geographic Coordination Area" the fire is located in, e.g., Northwest, Northern Rockies, etc.

I. C. Unit: Designate the local administrative unit, e.g., Hart Mountain Refuge Area, Flathead Indian Reservation, etc.

I. D. EFSA#: Identify the number assigned to the most recent EFSA for this fire.

I. E. Fire Name: Self-explanatory.

I. F. Incident Number: Identify the agency number assigned to the fire, e.g., BOD 296, BNF 001.

I. G. Management Code: Insert the local unit's fiscal management code.

I. H. Date/Time Prepared: Self-Explanatory.

I. J. Attachments: Check here to designate attachments used in the completion of the EFSA.

I. <u>ESCAPED FIRE SITUATION ANALYSIS</u>		
A. JURISDICTION(S)	B. GEOGRAPHIC AREA	
C. UNIT	D. EFSA#	
E. FIRE NAME	F. INCIDENT #	
G. MANAGEMENT CODE		
H. DATE/TIME PREPARED: _____		
I. <u>ATTACHMENTS</u> -		
Complexity Matrix _____		
Success/Failure Matrix _____		

Maps	_____		
Other	_____		

This page is completed by the Agency Administrator.

Section II. Objectives and Constraints

II. A. Objectives Criteria: Specify criteria that should be considered in the development of alternatives. Economic criteria could include closure of all or portions of an area, thus impacting the public, or impacts to transportation, communication and resource values.

Environmental criteria could include management objectives for airshed, water quality, wildlife, etc.

Social criteria could include any local attitudes toward fire or smoke that might affect decisions on the fire, safety, etc.

Other criteria might include legal or administrative constraints which would have to be considered in the analysis of the fire situation, such as the need to keep the fire off other agency lands, etc.

II. B. Constraints: List constraints on suppression action. These could include constraints to designated wilderness, wilderness study areas, environmentally or culturally sensitive areas, irreparable damage to resources or smoke management/air quality concerns.

II.	OBJECTIVES AND CONSTRAINTS
TO BE COMPLETED BY AGENCY ADMINISTRATOR	

A. OBJECTIVES CRITERIA

1. ECONOMIC

2. ENVIRONMENTAL

3. SOCIAL

4. OTHER

B. CONSTRAINTS

This page is completed by the Fire Manager and/or Incident Commander.

Section III. Alternatives

III. A. Strategic Plan of Control: Briefly describe the general suppression strategies for each alternative. These could include direct, indirect, direct and indirect, confine, contain or control strategies. A "no suppression" alternative is not acceptable.

III. B. Narrative: Briefly describe each alternative with geographic names, locations, etc., that would be used when implementing a suppression strategy. For example, contain within the Starvation Meadows' watershed by the first burning period, etc. A map for each alternative should be prepared. The map should be based on the "Calculation of Probabilities" and include other relevant information.

III. C. Resources Needed: Self-explanatory.

III. D. Final Size: Estimated final size for each alternative at time of containment.

III. E. Estimated Contain/Control Date: Estimates for each alternative should be made based on predicted weather, fire behavior, resource availability and the effects of suppression efforts.

III. F. Suppression Cost: Estimate suppression costs for each alternative, including mop-up when necessary.

III. G. Probability of Success: Base estimates from 0 to 100% for each alternative strategy.

III. H. Complexity: Assign the complexity rating calculated on the page 1 attachments for each alternative, e.g., Type III, II, Type I, etc.

III. ALTERNATIVES			
TO BE COMPLETED BY FIRE MANAGER/COMMANDER			
	A	B	C
A. STRATEGIC PLAN OF CONTROL			
B. NARRATIVE			
C. RESOURCES NEEDED:			
HANDCREW	_____	_____	_____
ENGINES	-	-	-
DOZERS	_____	_____	_____
AIRTANKERS	-	-	-
HELICOPTERS	_____	_____	_____
	_____	_____	_____
	-	-	-
D. FINAL SIZE			
E. EST. CONTAIN/ CONTROL DATE			
F. SUPPRESSION COST			

IV. EVALUATION OF ALTERNATIVES			
TO BE COMPLETED BY AGENCY ADMINISTRATOR & FIRE MANAGER/COMMANDER			
	A	B	C
A. EVALUATION PROCESS <i>ECONOMIC</i> Timber Improvements Recreation Wilderness Wildlife Water Forage Other (Specify)			
<i>ENVIRONMENTAL</i> Air Visual Fuels Threatened & Endangered Spec. Other (Specify)			
<i>SOCIAL</i> Firefighter Safety Employment Public Concern Public Safety Cultural Other (Specify)			
<i>OTHER</i>			

G. PROBABILITY OF SUCCESS			
H. COMPLEXITY			
ATTACH MAPS FOR EACH ALTERNATIVE			

This page is completed by the Agency Administrator, Fire Manager and/ or Incident Commander.

Section IV. Evaluation of Alternatives

IV. A. Evaluation Process: Conduct an analysis for each element of each objective criteria and each alternative. Objective criteria should match those identified in section II.A. Use the best estimates available. Provide ratings for each alternative and corresponding objective element. Fire effects may be negative, cause no change, or may be positive. Examples are: 1) a system which employs a "-" for negative effect, a "0" for no change, and a "+" for positive effect; 2) a system which uses a numeric factor for importance of the consideration (soils, watershed, political, etc.) and assigns values (such as -1 to +1, -100 to +100, etc.) to each consideration, then arrives at a weighted average. Some agencies can estimate dollar amounts for resource values. If so, this data is preferred. Use those methods which are most useful to managers and most appropriate for the situation and agency.

IV. B. Sum Of Resource Values: Calculate the net effect of the rating system used for each alternative. This could include the balance of: pluses (+) and minuses (-), numerical rating (-3 and +3), resource values as a dollar value, etc.

B. SUM OF RESOURCE VALUES			
------------------------------	--	--	--

This page is completed by the Agency Administrator.

Section V. Analysis Summary

V. A. Compliance with Objectives: Prepare brief narratives that summarize each alternative's effectiveness in meeting each objective. Alternatives that do not comply with objectives are not acceptable. Narratives could be based on effectiveness and efficiency. For example: "most effective and least efficient," "least effective and most efficient," or "effective and efficient." Or answers could be based on a two-tiered rating system such as "complies with objective" and "fully complies with or exceeds objective." Use a system that best fits the manager's needs.

V. B. Pertinent Data: Data for this section has already been presented, and is duplicated here to help the Agency Administrator confirm their selection of an alternative. Complexity is calculated in the page 1 attachments and displayed on page 3, section III.G. Size is displayed on page 3, section III.D. Suppression Costs are displayed on page 3, section III.F. Resource Values have been calculated and displayed on page 4, section IV.B. Safety is rated and displayed on page 4, section IV.A. Probability of Success is calculated in the page 1 attachments and displayed on page 3, section III.H.

V. C. External and Internal Influences: Assign information and data occurring at the time the EFSA is signed. Identify the Preparedness Index (1 through 5) for national and regional levels. Designate the Resource Availability status. This information is available at the Regional Coordination Center. Designate "yes," indicating an up-to-date weather forecast has been provided to the Agency Administrator. Indicate the Incident Priority assigned regionally by the local MAC group. Assign information to the "other" category as needed by the Agency Administrator.

Section VI. Decision

Identify the alternative selected, a brief rationale for the decision, and a signature with date and time. The signature of the appropriate Agency Administrator is mandatory.

VI.	<u>DECISION</u>
_____ SELECTED ALTERNATIVE:	
RATIONALE:	
<hr style="width: 60%; margin-left: 0;"/>	
_____ AGENCY ADMINISTRATOR SIGNATURE	_____ DATE/TIME

This section is completed by the Agency Administrator or designate.

Section VII. Daily Review

The date, time and signature of reviewing officials are reported in each column for each day of the Incident. The status of Incident Priority , Weather Forecast, Preparedness Level and EFSA Valid is completed for each day reviewed. Ratings for the Incident Priority, Weather Forecast and Preparedness Level are addressed on page 5, section V.C. A "yes" is required in the "EFSA Valid" to continue use of the this EFSA. A "no" indicates this EFSA is no longer valid and another EFSA must be prepared.

Section VIII. Final Review

This section is completed by the Agency Administrator. A signature, date and time are provided once all conditions of the EFSA are met.

VII. DAILY REVIEW

TO BE COMPLETED BY AGENCY ADMINISTRATOR OR DESIGNATE

SELECTED ALTERNATIVE TO BE REVIEWED DAILY TO DETERMINE IF STILL VALID UNTIL CONTAINMENT/CONTROL

REVIEW			P R E P A R E D N E S S	L E V E L	I N C I D E N T	P R I O R I T Y	W E A T H E R	F O R E C A S T	E F S A V A L I D
DATE	TIME	BY							

IF EFSA IS NO LONGER VALID, A NEW EFSA WILL BE COMPLETED.

VIII. FINAL REVIEW

THE ELEMENTS OF THE SELECTED ALTERNATIVE WERE MET ON:

Date: _____ Time: _____

By: _____
Agency Administrator

A GUIDE FOR ASSESSING FIRE COMPLEXITY

The following questions are presented as a guide to assist the Agency Administrator and staff in analyzing the complexity or predicted complexity of a fire situation. Because of the time required to assemble or move an Incident Management Team to a fire, this checklist should be completed when a fire escapes initial attack and be kept as part of the fire records. This document is prepared concurrently with the preparation of and attached to a new or revised Escaped Fire Situation Analysis. It must be emphasized that this analysis should, where possible, be based on predications to allow adequate time for assembling and transporting the ordered resources.

Use of the Guide:

1. Analyze each element and check the response yes or no.
2. If positive responses exceed, or are equal to, negative responses within any primary factor (A through G), the primary factor should be considered as a positive response.
3. If any three of the primary factors (A through G) are positive responses, this indicates the fire situation is or is predicted to be Type I.
4. Factor H should be considered after all above steps. If more than two of these items are answered yes, and three or more of the other primary factors are positive responses, a Type I team should be considered. If the composites of H are negative, and there are fewer than three positive responses in the primary factors (A-G), a Type II team should be considered. If the answers to all questions in H are negative, it may be advisable to allow the existing overhead to continue action on the fire.

GLOSSARY OF TERMS

Potential for blow-up conditions - Any combination of fuels, weather, and topography excessively endangering personnel.

Rare or endangered species - Threat to habitat of such species, or in the case of flora, threat to the species itself.

Smoke management - Any situation which creates a significant public response, such as smoke in a metropolitan area or visual pollution in high-use scenic areas.

Extended exposure to unusually hazardous line conditions - Extended burnout or backfire situations, rock slides, cliffs, extremely steep terrain, abnormal fuel situations such as frost killed foliage, etc.

Disputed suppression responsibility - Any fire where responsibility for suppression is not agreed upon due to lack of agreements or different interpretations, etc.

Controversial fire policy - Escaped management fire is one example of this. Another is differing fire policies between suppression agencies when the fire involves multiple ownership.

Pre-existing controversies - These may or may not be fire management related. Any controversy drawing public attention to an area may present unusual problems to the fire overhead and local management.

Have overhead overextended themselves mentally or physically - This is a critical item that requires judgment by the responsible agency. It is difficult to write guidelines for this judgment because of the wide differences between individuals. If, however, the Agency Administrator feels the existing overhead cannot continue to function efficiently and take sage and aggressive action due to mental or physical reasons, assistance is mandatory.

FIRE COMPLEXITY ANALYSIS

A. FIRE BEHAVIOR: Observed or Predicted		Yes/No	
1.	Burning Index (From on-site measurement of weather conditions). Predicted to be above the 90% level using the major fuel model in which the fire is burning.	___	___
2.	Potential exists for "blowup" conditions (fuel moisture, winds, etc).	___	___
3.	Crowning, profuse or long-range spotting.	___	___
4.	Weather forecast indicating no significant relief or worsening conditions.	___	___
TOTAL.....		___	___
B. RESOURCES COMMITTED			
1.	200 or more personnel assigned.	___	___
2.	Three or more divisions.	___	___
3.	Wide variety of special support personnel.	___	___
4.	Substantial air operation which is not properly staffed.	___	___
5.	Majority of initial attack resources committed.	___	___
TOTAL.....		___	___
C. RESOURCES THREATENED			
1.	Urban interface.	___	___
2.	Developments and facilities.	___	___
3.	Restricted, threatened or endangered species habitat.	___	___
4.	Cultural sites.	___	___
5.	Unique natural resources, special designation zones or wilderness.	___	___
6.	Other special resources.	___	___
TOTAL		___	___
D. SAFETY			
1.	Unusually hazardous fire line conditions.	___	___
2.	Serious accidents or fatalities.	___	___
3.	Threat to safety of visitors from fire and related operations.	___	___
4.	Restrictions and/or closures in effect or being considered.	___	___
5.	No night operations in place for safety reasons.	___	___
TOTAL.....		___	___

E. OWNERSHIP

Yes/No

- | | | | |
|------------|---|-----|-----|
| 1. | Fire burning or threatening more than one jurisdiction. | ___ | ___ |
| 2. | Potential for claims (damages). | ___ | ___ |
| 3. | Different or conflicting management objectives. | ___ | ___ |
| 4. | Disputes over suppression responsibility. | ___ | ___ |
| 5. | Potential for unified command. | ___ | ___ |
| TOTAL..... | | ___ | ___ |

F. EXTERNAL INFLUENCES

- | | | | |
|------------|---|-----|-----|
| 1. | Controversial fire policy. | ___ | ___ |
| 2. | Pre-existing controversies/relationships. | ___ | ___ |
| 3. | Sensitive media relationships. | ___ | ___ |
| 4. | Smoke management problems. | ___ | ___ |
| 5. | Sensitive political interests. | ___ | ___ |
| 6. | Other external influences. | ___ | ___ |
| TOTAL..... | | ___ | ___ |

G. CHANGE IN STRATEGY

- | | | | |
|------------|---|-----|-----|
| 1. | Change in strategy to control from confine or contain. | ___ | ___ |
| 2. | Large amounts of unburned fuel within planed perimeter. | ___ | ___ |
| 3. | EFSA invalid or requires updating. | ___ | ___ |
| TOTAL..... | | ___ | ___ |

H. EXISTING OVERHEAD

- | | | | |
|------------|--|-----|-----|
| 1. | Worked two operational periods without achieving initial objectives. | ___ | ___ |
| 2. | Existing management organization ineffective. | ___ | ___ |
| 3. | Overhead overextended themselves mentally and/or physically. | ___ | ___ |
| 4. | Incident action plans, briefings, etc. missing or poorly prepared. | ___ | ___ |
| TOTAL..... | | ___ | ___ |

L. Species Lists

1. **Plants of Bandelier National Monument**
2. **Vertebrates of Bandelier National Monument**

Lists on file at Bandelier National Monument.

M. Ten-Year Prescribed Fire Schedule and Unit Maps

1. Ten-Year Prescribed Fire Schedule

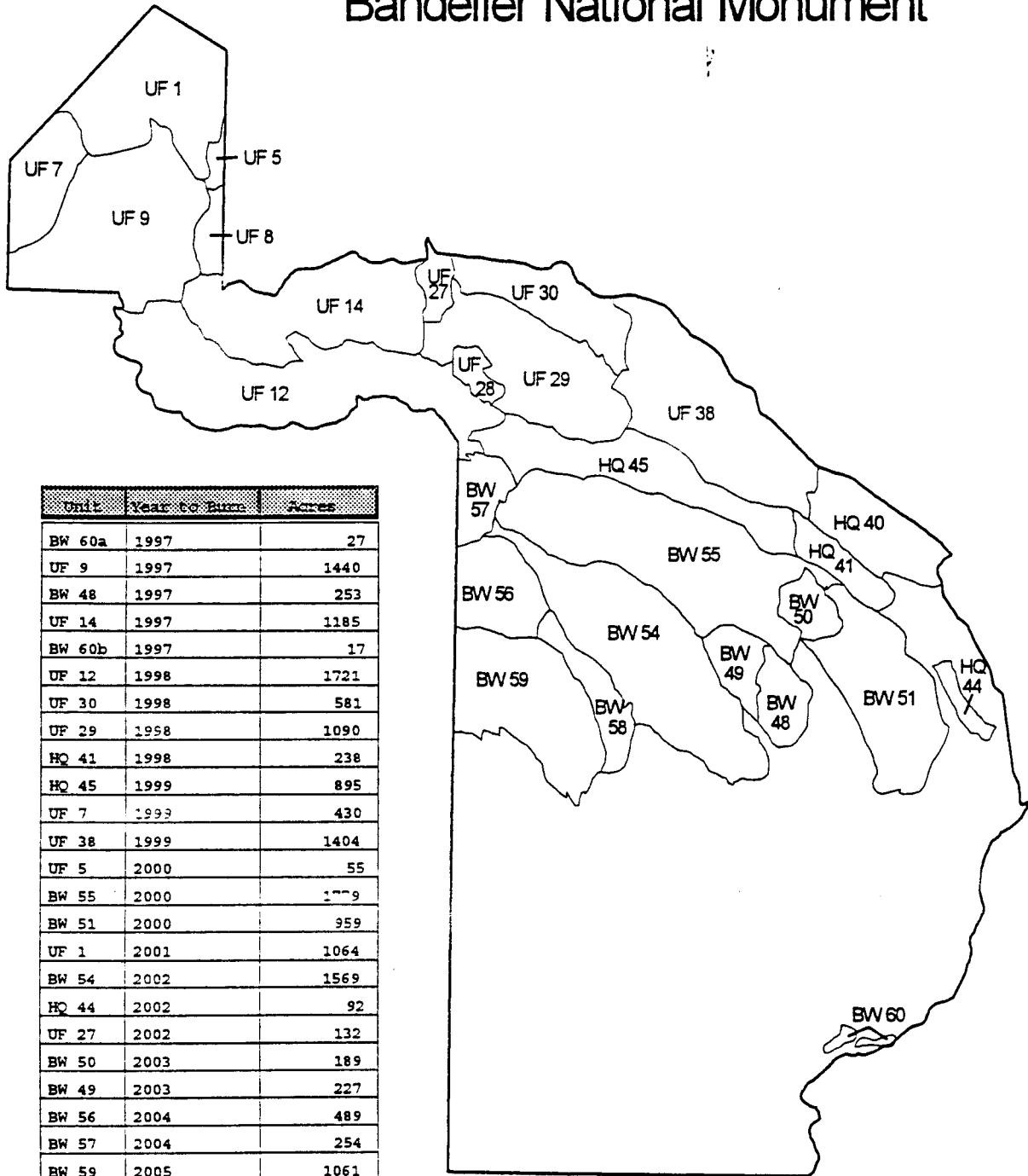
(rev 3/97)

UNIT	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
UF-1					1064F						
UF-5				55F							
UF-7			430F								
UF-8									129S		
UF-9	1440S										1440S
UF-12		1721S									
UF-14	1123S									1123S	
UF-27						132F					
UF-28									115S		
UF-29		1090F									
UF-30		581F									
UF-38			1404S								
HQ-40										563S	
HQ-41		238S									
HQ-44						92S					92S
HQ-45			895S								
BW-48	253F										
BW-49							227F				
BW-50							189S				
BW-54						1569S					
BW-55				1779S							
BW-56								489F			
BW-57								254F			
BW-58									302F		
BW-59									1061F		
BW-60	44S										
BW-51				959S							
Totals	2660	3630	2723	2793	1064	1793	416	743	1607	1686	1532

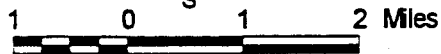
LEGEND

- 1) Burn unit numbers are keyed to the attached maps.
- 2) UF = Upper Frijoles
HQ = Headquarters
BW = Bandelier Wilderness
- 3) S = Spring burn (includes Dec-June months)
F = Fall burn (includes July-Nov months)
- 4) Schedule is subject to change based on unpredictable circumstances.
- 5) Burn unit acreages indicated determined from park GIS.

Management Ignited Prescribed Fire Units Bandelier National Monument



Unit	Year to Burn	Acres
BW 60a	1997	27
UF 9	1997	1440
BW 48	1997	253
UF 14	1997	1185
BW 60b	1997	17
UF 12	1998	1721
UF 30	1998	581
UF 29	1998	1090
HQ 41	1998	238
HQ 45	1999	895
UF 7	1999	430
UF 38	1999	1404
UF 5	2000	55
BW 55	2000	1779
BW 51	2000	959
UF 1	2001	1064
BW 54	2002	1569
HQ 44	2002	92
UF 27	2002	132
BW 50	2003	189
BW 49	2003	227
BW 56	2004	489
BW 57	2004	254
BW 59	2005	1061
UF 28	2005	115
UF 8	2005	129
BW 58	2005	302
HQ 40	2006	563



N. Wildfire Prevention Plan

FP ZONE 1- CERRO GRANDE SUMMIT

HAZARD: MODERATE, Montane grasslands, steep slopes leading to USFS and private lands; area presently closed to visitation.

VALUE: MODERATE, USFS and private watershed values of moderate value.
RISK: LOW, Limited risk due to area closure to entry.

ACTIONS

Education and enforcement through normal patrols. Seasonal training to emphasize need for prevention education.

Responsible person(s): Fire Management Officer/Supervisory Forestry Technician

FP ZONE 2- ACQUISITION PROPER

HAZARD: HIGH, Heavy, down and dead fuels; continuous fuels along state highway 4.

VALUE: HIGH, Resource values of vegetative structure, overstory species such as old growth subject to destruction during high hazard periods.

RISK: HIGH, Risks associated with heavy highway commuter traffic.

ACTIONS

Place prevention posters along highway at each end of boundary. Increase prevention patrols by Engine 91 during staffing level IV or V.

Responsible person: Supervisory Forestry Technician

PF ZONES 3,4.& 5- APACHE & ESCOBAS MESAS

HAZARD: MODERATE, Prescribed burning has lessened the hazard in these zones, with the exception of zone 4 which contains heavier fuels.

VALUE: MODERATE, Resource values of Ponderosa Campground, the trailer sites adjacent, the adjacent USFS and Department of Energy (Los Alamos National Laboratory) lands and associated values are included in this assessment.

RISK: MODERATE. Risks included are hiking visitors, highway traffic, and campground users.

ACTIONS

Place prevention posters in the Ponderosa Campground and trailhead. Include the campground area in all prevention patrols for purposes of visitor contacts with groups. Enforce all fireworks restrictions.

Responsible Person: Supervisory Forestry Technician

ZONE 5 - UPPER CROSSING

HAZARD: HIGH, Hazard due primarily to fuels and topography, which can act to funnel high winds through the canyon and presenting a threat to visitor safety.

VALUE: MODERATE, Largely resource values which are difficult to protect during wildfire emergencies, such as sensitive plant and animal habitat, trails and waterbars, etc.

RISK: MODERATE, Primarily due to hikers and backcountry campers who move along the Canyon trail.

ACTION

Place prevention message in Visitor Center for permittees. On-going hazard fuel reduction in canyon north west of Ceremonial Cave.

Responsible Person: Supervisory Forestry Technician

ZONE 7 - UPPER ALAMO/CAPULIN

HAZARD: HIGH, Fuels and accessibility are hazards within this zone; until hazard fuels are treated, this area will remain priority for prevention efforts.

VALUE: MODERATE, Recreation sites in upper Alamo Canyon, trails and waterbars, and USFS lands adjacent to area.

RISK: MODERATE, Recreational activities along trails, i.e., camping and hiking;

ACTION

Schedule MIPFs to reduce hazard fuels. Visitor Center staff will notify backcountry users of fuel conditions.

Ranger contact and enforcement. Responsible Person(s): Chief Ranger/backcountry patrol rangers and Supervisory Forestry Technician

ZONES 8 & 12 - CORRAL HILL AND TSANKAWI SECTION

HAZARD: MODERATE, Corral Hill fuels subject to high rate of spread wildfires; Tsankawi fuels low-moderate under normal wind conditions.

VALUE: MODERATE, Corral Hill trail system; Tsankawi Section heavy day use trails, ladders, waterbars, etc.

RISK: MODERATE, Risks associated with visitor and backcountry users; Tsankawi Section heavy day-use traffic along the Ruins Trail.

ACTION

Prevention messages on bulletin board, Mid-Alamo trailhead; messages also on Tsankawi Section bulletin board.

Enforcement and contact by ranger personnel, VIP contacts.

ZONE 9 - HEADQUARTERS

HAZARD: MODERATE, Mostly treated by MIPFs in past 5 years; however, some heavy fuels on Falls Trail.

VALUE: HIGH, VISITOR FACILITIES, including parking, visitor center, picnic area, administrative offices, maintenance area, housing, and campground facility; major hiking trails, ruins, historical buildings, and historic landscape.

RISK: HIGH, 95% of all visitors uses this area, in a variety of ways including hiking, picnicking, and camping.

ACTION

Post prevention messages via brochures and handouts at visitor center and entrance station; engine patrols in high staffing periods will contact visitors in campground and picnic areas.

O. Interagency Contacts and Coordination

1. US Forest Service, Santa Fe National Forest, Santa Fe
 - a. FMO - Mike Matarrese
 - b. Supervisory Dispatcher - John Romero
 - c. Support Dispatcher - Epifanio Abeyta
2. Española District
 - a. District Ranger - Lori Osterstock
 - b. FMO - Robert Remillard
3. Jemez District
 - a. District Ranger - John Peterson
 - b. FMO - Phil Neff
4. BIA - Eight Northern Pueblos
FMO - Jerome Jenkins
5. SW Coordination Center
Center Director - John Schulte
6. NMSF - Bernalillo District
 - a. FMO - Kim Kostelnik
 - b. District Forester - Fred Rossback
7. BLM
State FMO - Bob Lee
8. Los Alamos County Fire Department
Chief Douglas MacDonald
9. New Mexico Environmental Improvement Division - Air Quality Bureau
Air Quality Specialist - Filberto Dominguez

P. Pre-attack Plan

1. Pre-attack Plan Resources

Note: Pre-attack Plan Maps on file in Fire Management Office.

2. Pre-season Risk Analysis

3. Pre-attack Escaped Fire Situation Analysis - Park HQ

4. Bandelier National Monument and Vicinity

See the following pages.

PRE-ATTACK PLAN RESOURCES

MOTELS

1. Bandelier Inn: White Rock (WR), State Route 4, 672-3838
2. Los Alamos Inn: LA, 220-1 Trinity, 662-7211
3. Hill Top House: LA, Trinity and Highway 502, 662-2441
4. Super 8: Española, 298 S. Riverside Drive, 505-753-5374
5. Chamisa Inn: Española, 920 Riverside Drive, 505-753-7291
6. Holiday Inn Express: LA, Trinity Drive, next to Shell Gas Station, due to open Fall 1997.

FOODSTORES

1. Smith's: WR, State Route 4, (has deli), 672-3811
2. Furr's: LA, Mari-Mac Willage, (has deli), 662-7210
3. Ed's Supermarket: LA, 1183 Diamond Drive, 662-9491
4. Pueblo Plaza Supermarket: Pojoaque, 455-2178
5. Furr's: Española, Big Rock Shopping Center, 505-753-7333

RESTAURANTS

1. Pizza Hut: WR, State Route 4, 672-1265
2. Pizza Hut: LA, Mari-Mac village, 662-2411
3. Sonic Drive-in: LA, 1695 Trinity, 662-3345
4. McDonalds: LA, 247 Trinity, 662-5100
5. Ashley's Restaurant:(Los Alamos Inn): LA, 2201 Trinity Drive, 662-7211

6. LA Subs: LA, 1715 Iris, 662-2423
7. McDonalds: WR, 109 Highway 4, 672-4094
8. Tony's Pizza: LA, 723 N. Central, 662-7799
9. Chiliworks: LA, 1743 Trinity, 662-7591
10. Kentucky Fried Chicken: LA, 1360 Trinity, 662-9719
11. Central Avenue Grill: LA, 1789 Central, 662-2005
12. The Hill Diner: LA, 1315 Trinity, 662-9745
13. Decolores: LA, 820 Trinity, 662-2324
14. Subway Sandwiches: LA, 1350 Central, 662-7883
15. Montoya's: LA, Mari-Mac Village, 662-7026
16. Viola's: LA, 17th Street in Community Center, 662-5617
17. Allied Meat Company (deli): LA, Mari-Mac Village, 662-2777
18. Amberly Restaurant: LA, 941 Community Center, 662-5590

HARDWARE

1. Metzgers: WR, State Route 4, 672-3856
2. Metzgers: LA, 1607 Trinity, 662-3715
3. LA Home Improvement: 232 DP Road, 662-5371

GAS STATIONS

1. Giant Stop N Go: 2373 Trinity, 662-2148
2. Hilltop 24 Hour Gas Service: Trinity at Central, 662-2441
3. Los Alamos Chevron: 2155 Trinity, 662-6464

COMPUTERS

1. Computerland: SF, 510 W. Cordova, 988-8800
2. Microsage: LA 1247 Central, 662-7244
3. Bill's Computer Shop: LA, 1290 17th Street, LA 662-6020
4. Roadrunner Computer Systems: SF, 1830 5th (at St. Mike's), 988-9200.

AVIATION

1. 1040 Airport Road, LA, 667-4521 for **landing permission**. If you land at airport without **permission**, you will be detained by LANL security and have to explain your situation. Runway length: 5,500 feet. Frequency: 123.00 Flight restriction to south until you hit Bandelier's boundary and the Rio Grande. Landing on runway 27, departure on runway 9.2
2. Santa Fe Airport, Airport Rd, 473-7243.

2. Ryder Truck Rental: SF, Siler Road and Agua Fria, 471-4579

GENERAL

1. Tony's Rentals: SF, 3147 Cerrillos, 471-1024
2. Time Rentals: LA, 170 East Gate, 662-4455
3. Gil's Rentals: Española, 1-505-753-2833
4. Capital Rentals: SF 2869 Trades West Road, near Siler Rd, 471-6187
5. SF Rentals: SF, 2707 Cerrillos, 473-2244
6. The Rental Place: SF, Agua Fria, 473-1099

POLICE AND FIRE

1. NM State Police: 827-9126
2. LA Police: Admin #, 662-8222. EMERGENCY 911
3. LA Fire: Admin 3, 662-8301
4. State Game and Fish: SF, 827-9376
5. USFS Law Enforcement: SF, 438-7800 (SF Zone Dispatch)

COMMUNICATIONS

1. Radio repair: King Radios, Val-Comm, ABQ, 249 Muriel NE, 505-292-7509
Motorola Radios: SF, 471-4904
2. SW SSO Radio Cache: Office of Ranger Activities, Fire Program Assistant.
988-6113
3. US West: 1-505-551-1653

LANDFILL

1. LA County: Refuse and landfill, East Jemez Road, 662-8163

4. LAMC: LA, 3917 West, 662-4281
5. LAMC: WR, Rover Drive, 672-3701

CAMERA, FILM, AND OFFICE SUPPLIES

1. LA Stationers: LA, 1907 Central, 662-4229
2. Brownelle's Hallmark: LA, Mari-Mac Village, 662-6501
3. Office Depot: SF, 2016 Cerrillos, 474-7181
4. New Mexico Discount Office Supply: SF, 524-A Cordova, 982-8811
5. Camera and darkroom: SF, 216 Galisteo, 983-2948

BOOT REPAIR AND SALES

1. Santa Fe Boots: SF, 950 W. Cordova Road, 983-8415
2. City Shoe Repair: SF, 950.5 Cordova Road, 983-8264
3. Red Wing Boots: SF, 3232 Cerrillos Road, 471-6283
4. Trujillo's Shoe Shop: Española, 422 N. Riverside Drive, 753-5831
5. Jacobs Shoe Repair Shop: SF, 646 Old Santa Fe Trail, 982-9774
6. Los Alamos Shoe Repair: LA, 1400 17th, 661-9620

TOILETS

1. L and L Portable Toilets: SF, Agua Fria Road, 471-1372 or 1-800-428-7406
2. Li'l Stinker Portable Toilets: SF, Mobile Phone: 690-2345, or 982-8040
3. New Mexico Chemical: ABQ 503 Carmony Road, 1-505-344-1212

TRUCKS

1. U-Haul Trucks: LA, Diamond Shamrock gas station, 662-2063

4. Los Alamos Shamrock: 1239 Trinity, 662-2063
5. Los Alamos Shell: 2591 Trinity, 662-6100
6. Los Alamos Tire and Service Center: 3701 Arkansas, 662-3774
7. Texaco: LA, 1399 diamond, 662-2227
8. Texaco: WR, 128 State Route 4, 672-3856
9. Shell: WR, Rover Blvd and Highway 4, 672-3106
10. Quik Stop (Conoco): WR, State Route 4 and Rover, 672-9207
11. Quik Stop (Conoco): LA, Diamond Drive and Arkansas, 662-3774

AUTO REPAIR AND PARTS

1. Glover's: 208 DP Road, 662-7647
2. Knecht Automotive: 201 Knecht, 662-9743
3. Napa Auto Parts: 1247 Central, 662-2868
4. Automotive Professionals: 99 DP road, LA, 662-6929

VEHICLE RENTAL

1. LA Airport, 662-4226
2. Hilltop House, 662-5046
3. GM Leasing: Española, 618 Oñate, 983-5750
4. Chevrolet Leasing: SF, SF Auto Park, 471-3700
5. State Route 4, 672-9457
6. Mari-Mac Village, 662-4777
7. Drug Company: LA, 1801 Central, 662-2211

PRE-SEASON RISK ANALYSIS

<u>Risk Factor</u>	<u>Current Level</u>	<u>Historic Average</u>
Precipitation Amount		
Energy Release Component		
1000 Hour Fuel Moisture [a drought assessment]		
Curing Rate- Grasses		
Episodic Wind Events (# of days w/ wind speed >15 mph sustained)		
Other Unusual Fire Weather Events		

Narrative Comments:

----- reviewer's signature	----- date
----- reviewer's signature	----- date
----- reviewer's signature	----- date
----- reviewer's signature	----- date

This analysis will be conducted in the spring prior to each fire season. If the risk analysis indicates potential for abnormal fire severity and/or duration, a copy of the analysis will be forwarded to the Chief, Branch of Aviation and Fire Management, Southwest Region along with a request for additional resources commensurate with the escalated risk (NPS-18, Section III, Chapter 7). Copies of risk analyses will be placed in the central files (Y-14).

PRE-ATTACK PLAN MAPS

LOCATIONS OF MAPS FOR THE PRE-ATTACK PLAN CAN BE FOUND IN THE FOLLOWING OFFICES/LOCATIONS:

UTILITIES: Maintenance Office

- > Water & Sewer - Drawing #315/41008, Drawer #9
- > Electrical - Drawing #315/41009A Drawer #7
- > Gas Line Plan - Drawing #315/41009 Drawer #6

ARCHAEOLOGICAL SITE MAPS: **SENSITIVE INFORMATION**, Found in Cultural Resource (Archaeologist) Office.

T & E SPECIES: **SENSITIVE INFORMATION**, Found in Resources Management or Ecological Services Office

VEGETATION MAP: Use GIS, Biological Resource Division, USGS, Bandelier Field Station Office (Dr. Allen)

INFORMATION INCLUDED ON BANDELIER PARK MAP:

- > Helispot Locations
- > Water Sources—hydrant locations are on map, Ranger Services Office
- > Staging Areas (Note: see also LANL Preattack Map, Emergency Ops Office, LANL)
- > Base Camp Locations
- > Roads & Trails
- > Important Visitor Use Areas

WILDLIFE FIRE MANAGEMENT
NPS-18

Guideline
 Section III
 Chapter 8
 Exhibit 2
 Page 1

USDI NATIONAL PARK SERVICE

ESCAPED FIRE SITUATION ANALYSIS

REGION	INTERMOUNTAIN	PARK	BANDELIER
DATE	TIME	EFSA NUMBER	OF

I. FIRE SITUATION

FIRE NAME	CURRENT SIZE
FUEL	FIRE BEHAVIOR
NARRATIVE (attach description of the existing fire situation):	

ALTERNATIVE APPROVED FOR IMPLEMENTATION:

SIGNATURE	TITLE	DATE	TIME
-----------	-------	------	------

II. FOLLOW UP

The selected alternative shall be reviewed prior to each operational period to determine if still valid. If not, new EFSA will be developed.

OPERATIONAL PERIOD REVIEW

BY	DATE	TIME
BY	DATE	TIME
BY	DATE	TIME
BY	DATE	TIME
BY	DATE	TIME
BY	DATE	TIME
BY	DATE	TIME
BY	DATE	TIME
BY	DATE	TIME
BY	DATE	TIME

III. EVALUATION CRITERIA

For each category develop the Agency Administrator decisions on specific objectives, expressed as measurable criteria, to be used in the selection of the preferred alternatives.

CRITERIA (Check those criteria which MUST be met)	MUST
ECONOMIC:	
FRIJOLES CANYON DEVELOPED AREA (GOVT)	X
MESA HOUSING (GOVT)	X
MESA CG (Juniper) (GOVT)	X
MESA MAINTENANCE FACILITIES (GOVT)	X
ENVIRONMENTAL:	
WATERSHED	
THREATENED AND ENDANGERED	
SOIL PROTECTION	X
WILDLIFE HABITAT	
SOCIAL:	
AIRSHED - QUALITY	
AESTHETICS - FRIJOLES CANYON	
GENERAL OUTDOOR RECREATION	
OTHER:	
CULTURAL RESOURCES	X
VISITOR VEHICLES	
ADJACENT OWNERSHIP (LANL/DOE)	X
APPROVED BY: (Agency Administrator)	Date & Time

IV. ALTERNATIVES

	A	B	C	D
GENERAL PLAN OF CONTROL (STRATEGIC)	FULL CONTROL	CONTAIN TO FIRST FUEL BREAK MODIFIED SUPPRESSION	FIRST CONTAIN TO WITHIN 1/2 MILE OF STRUCTURES IN FRIJoles CANYON &/or MESA TOP DEVELOPED AREAS	
SPECIFIC PLAN OF OPERATION (TACTICAL)	DIRECT ATTACK	DIRECT/INDIRECT ATTACK OR FIRE EDGE	INDIRECT ATTACK	
PROBABILITY OF SUCCESS	95%	90%	85%	
ESTIMATED CONTROL TIME	less than 18 hr	36 hrs	48 hrs	
ATTACH MAPS OF ALTERNATIVES				

WILDLIFE FIRE MANAGEMENT
NPS-18

V. EFFECTS

	A	B	C	D
SIZE (Predicted final size in acres)	10	100	400	
MARKET ELEMENTS				
Improvements	---	---	---	
Recreation	n/c	+	++	
Concessions	n/c	n/c	n/c	
Fees enhancement	n/a	n/a	n/a	
Special use permits	n/c	n/c	---	
Water				
Other (Specify)				
SUM OF RESOURCE DAMAGE	\$	\$ -2	\$ -4	\$
NON-MARKET ELEMENTS				
Smoke	n/c	n/c	---	
Visual	n/c	n/c	---	
Vegetation	n/c	n/c	n/c	
Threatened & Endangered Species	n/c	+	+++	
Other (Specify)				
SUM OF RESOURCE DAMAGE	\$ -1	\$ -1	\$ -2	\$
SOCIAL ELEMENTS				
Firefighter Safety	n/c	n/c	---	
Public Concern	+++	+	-	
Public Safety	+++	+	-	
Cultural				
Archaeology				
Other (Specify)				
SUM OF SOCIAL DAMAGE	\$ +5	\$ 0	\$ -6	\$
SUM OF LOSSES	\$	\$	\$	\$
SUPPRESSION COSTS	\$	\$	\$	\$
COST PLUS LOSS	\$	\$	\$	\$

VI EVALUATION
ALTERNATIVES

CRITERIA (From Section III)	A	B	C	D
ECONOMIC	Minor impact Full Suppression effort; minimum effect to structures/developments	Potential for litigation upon escape.	Potential litigation for escapes. Direct threat to housing, CCC Historic District & Visitor Use facilities.	
ENVIRONMENTAL	Little direct impact from fires. Re-queries rehab.	Impacts to air quality; some soil movement following rain; positive fuel reduction.	Impact to air quality for several days; positive fuel reduction effects; extensive rehab required.	
SOCIAL	Public concerns minimized; cultural sites & materials protected except for small area.	Public concerns need addressing; Archaeologist(s) required on site; Evacuation of park possible	Public is concerned; Resource Advisors assigned; cultural resources (i.e., wood) at risk	
OTHER	Park prepared for public questions	Press Release & radio announcement Mobilize PIO	PIO mobilized Keep neighbors informed	
TOTAL				

KEY: 0 = Does not meet criteria
1 = Partially meets criteria
2 = Fully meets criteria

VII. DECISION TREE

Include Decision Tree Analysis.

Alternative A Selected -- then B -- then C

Justification:

- Modified suppression increases exposure of humans
- Potential for soil erosion from higher intensity fire on slopes.
- Direct attack in HQ Fire Management Unit keeps fire at minimum size commensurate with values at risk.
- Rehab will be minimized with direct attack.
- Public will be protected from smoke excesses.
- Cultural resource damage/loss minimized.
- Heavy park visitor use area will retain aesthetics, recreational values.

Preferred Alternative A