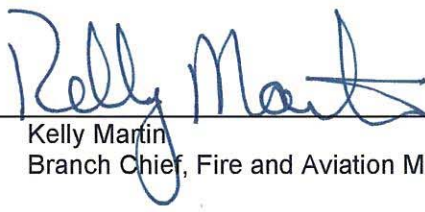


# YOSEMITE NATIONAL PARK ANNUAL FIRE MANAGEMENT PLAN



# 2009

# SIGNATURE PAGE

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## I. INTRODUCTION

National Park Service Management Policies govern fire management to support park management objectives. Under the National Park Service Director's Order 18 (DO 18, NPS 2005), Yosemite National Park (YNP) is obligated to develop and implement an *Operational* Fire Management Plan. The YNP Fire Management Plan has been prepared to guide the full range of fire management related activities. It provides a framework for the management of wildland fire, prescribed fire, and hazard fuel reduction as tools to safely accomplish the resource protection and management objectives of Yosemite National Park as described in various park management plans.

The restoration of fire to its natural role in park ecosystems is one of the highest resource management priorities of Yosemite National Park. Yosemite National Park encompasses approximately 750,000 acres in the Sierra Nevada of California across a wide variety of ecosystems ([Map 2-1](#)). All major forest and chaparral plant communities in Yosemite have evolved under the influence of periodic fires, and many plants and associated wildlife have developed adaptations to a regime of frequently occurring fires. Decades of fire suppression altered park vegetation and wildlife habitat.

Cultural resources also benefit from managed fire. Managed fire can be used to protect cultural sites from unnaturally high intensity fire, or to maintain cultural landscapes. Fire was used by American Indians to maintain meadows and open stands of conifers and oaks in Yosemite Valley. Historically, this helped maintain important traditional plants and living space.

Yosemite National Park's fire management program employs a variety of methods to accomplish and support fire and resource management objectives and to reduce the risk of wildfire in and adjacent to the park. Strategies in this plan are based on knowledge gained from fire and fuels research and monitoring, and from experience gained in Yosemite National Park over the last 50 years. Over the last 30 years, Federal fire policy has changed from suppression of all wildfires to a policy allowing a single fire to be used as a tool to meet multiple land management and public safety objectives. Yosemite National Park has consistently been at the forefront, in terms of implementing fire policy that returns fire to the landscape as a desired ecosystem process, protecting both human and natural communities as a result.

After more than 30 years of proactive response to wildland fire, the park is far from restoring natural fire regimes to the entire park landscape, though significant inroads have been made (Caprio and Graber 2000). While fuel reduction and prescribed burning have increased since the 1990 A-Rock Fire, developed areas are still at risk from uncontrolled wildland fires. The 2001 Federal Fire Policy specifically mandates public land agencies to reduce the amount of forest and shrubland fuels around areas with homes and buildings, and to restore ecosystems to a more natural, fire-tolerant balance. In response, the National Park Service has issued new fire management guidelines that require updated fire management plans.

Yosemite National Park's *Operational* Fire Management Plan serves to utilize the new fire management guidelines in outlining procedures for managing fire in Yosemite National Park; for restoration and maintenance of ecosystems, for reduction of hazard fuels, for protection of natural and cultural resources, and for protection of wildland urban interface communities ([Map 1-2](#)).

### A. REASON FOR DEVELOPING THE YOSEMITE FIRE MANAGEMENT PLAN

National Park Service wildland fire management activities are essential to the protection of human life, personal property and irreplaceable natural and cultural resources, and to the accomplishment of the NPS mission. High safety risks and expenses associated with fire management activities require exceptional skill and attention to detail when planning and implementing fire management activities.



Fire management plans are fundamental strategic documents that guide the full range of fire management related activities permitted by policy. The National Park Service (DO 18, NPS 2008) which says requires them: "Each park with burnable vegetation must have an approved Fire Management Plan that will address the need for adequate funding and staffing to support its fire management program. Parks having an approved Fire Management Plan and accompanying National Environmental Policy Act (NEPA) compliance may utilize wildland fire to achieve resource benefits in predetermined fire management units. Parks lacking an approved Fire Management Plan may not use resource benefits as a primary consideration influencing the selection of a suppression strategy, but they must consider the resource impacts of suppression alternatives in their decisions."

The restoration of fire to its natural role is the foundation of the Yosemite National Park fire program. In determining this need, YNP prepared a Fire Management Plan in conjunction with an Environmental Impact Statement (EIS) in 2004. The EIS is designed to present alternatives to implement the National Park Service and the Federal Fire policies. As a result, the EIS supports the chosen implementation document for the fire program- the *Operational* Fire Management Plan (hereafter, Fire Management Plan).

Furthermore, the Yosemite Fire Management Plan has been developed to adhere to the NPS

Wildland Fire Management Policy and the guiding principles from the 1995 Federal Wildland Fire Policy.

[Yosemite National Park Fire Management Plan EIS – Record of Decision](#)

## **B. COLLABORATIVE PROCESS USED IN DEVELOPING THE YOSEMITE FIRE MANAGEMENT PLAN**

Yosemite National Park utilized a collaborative process to develop the underlying land management plan direction and the fire management plan. In preparing the Final Yosemite Fire Management Plan/Environmental Impact Statement in 2004, there were many individuals and organizations that were consulted and invited to be a part of the planning and development process (Section XII). As the Fire Management Plan is implemented there are additional collaborative opportunities that are available.

## **C. POLICY**

Fire management is an integral part of the park's natural and cultural resource management program, and the Yosemite Fire Management Plan will assist in achieving land management objectives in the 1980 General Management Plan, the 1993 Resources Management Plan, and the 1997 Vegetation Management Plan for Yosemite National Park. The Fire Management Plan is the result of collaboration with, and integration of, the goals and objectives of these plans.

The Yosemite Fire Management Plan will be used to develop a program for the park, and to provide guidance to develop coordinated fire and fuels programs with neighboring agencies and communities, with emphasis on the wildland urban interface area (WUI). Neighboring FIRESAFE councils are informed of, and involved in, the generation of wildland hazard fuel reduction programs. The plan will also implement fire management policies and help achieve resource management and fire management goals as defined in:

1. [Federal Wildland Fire Management Policy and Program Review \(2001\)](#).
2. [Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and](#)
3. [Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy \(USDOJ/USDA\)](#).

A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan ([Original – May 2002](#), [Update – December 2006](#)).

## **D. COMPLIANCE AND PLANNING REQUIREMENTS**

### **1. National Environmental Policy Act**

The decision to prepare an Environmental Impact Statement (EIS) for the Yosemite Fire Management Plan was made by the Superintendent of Yosemite National Park after specific issues were raised by the public during preliminary scoping (conducted in 1999). In addition, the need for the Yosemite Fire Management Plan/EIS was determined for the following reasons:

- Fire has a natural role in maintaining and sustaining ecosystems in Yosemite National Park, some of which have been altered by past fire suppression activities. Refinements to the fire management program are needed that will promote ecosystem sustainability.
- Human communities, cultural resources (i.e., historic structures, blazed trees, and pictographs), campgrounds, and other developed areas of the park need protection from unwanted, high-intensity wildland fires. Fire treatments and pre-treatments (e.g., prescribed fire, mechanical thinning of understory vegetation, pile burning, chipping) are needed to reduce the risk of catastrophic fire and ensuing property loss, and to begin to reverse the fuel accumulation and ecosystem changes that have created these risks.
- Fire can help restore and maintain cultural and traditional landscapes valued by visitors and descendants of culturally associated American Indians.
- Response to wildland fires, prescribed burning, and fuel reduction treatments require up-to-date planning and preparation.
- Fire management activities require collaboration with federal, state, county, tribal and local agencies, and a fire management plan provides a basis for communication, coordination, and project planning with partner agencies.
- Yosemite National Park must comply with the 2001 Federal Fire Policy.

The Final Yosemite Fire Management Plan/EIS was prepared to comply with requirements of the National Environmental Policy Act (NEPA), the National Historic Preservation Act, the Endangered Species Act, and the Wild and Scenic Rivers Act. The legal authority for preparing and implementing the Yosemite Fire Management Plan is 16 USC 1 - 4, which is the 1916 Organic Act for the National Park Service. This Yosemite *Operational* Fire Management Plan is the working document for guiding fire management actions in Yosemite National Park.

Following the public comment period on the Draft Yosemite Fire Management Plan/EIS and consultations on actions that affected historic resources or special-status species, the Final Yosemite Fire Management Plan/EIS was prepared. At the conclusion of a 30-day waiting period, the National Park Service issued a Record of Decision, signed by the Pacific West Regional Director of the National Park Service. The Yosemite Fire Management Plan/EIS is the working document for guiding fire management actions in Yosemite National Park and the Operational Fire Management Plan (this document) is the working document for implementing fire management actions in Yosemite National Park. Appendix D has the Record of Decision for the Preferred Alternative from the Fire Management Plan/EIS.

This section is intended to link NPS and National Fire Policy to the fire management plan. It should also summarize in broad programmatic terms the direction for managing fire on the landscape found in the park's land and resource management planning documents, including the following:

The Fire Management Plan/EIS will incorporate a programmatic approach to the National Environmental Policy Act of 1969 (NEPA) that covers all activities described in the fire management plan. This will reduce the need for NEPA documents for individual projects addressed in the FMP. Additional NEPA documents such as, Environmental Assessments (EAs) or Categorical Exclusions (CEs) for specific burns would need to be done only if external controversial issues arise.

The Yosemite Fire Management Plan is an implementation document that would allow for the full range of response to wildland fire and prescribed fire, as well as mechanical fuels reduction techniques, in defined areas of the park without additional NEPA compliance. The effects of using the full range of response to wildland fire, prescribed fire, and mechanical techniques to meet management objectives in specific areas of the park are described in the Yosemite Fire Management Plan/EIS, which establishes programmatic prescribed fire and mechanical treatment units (locations) and identifies the range of treatments available to use within them and the potential effects. With regard to prescribed fire, fire will be applied within a specific range of conditions (the prescription), which in turn is expected to produce a consistent range of effects.

Site specific prescribed fire plans are directed by National Park Service policy (DO 18 and RM 18, NPS 2008) and will be prepared by fuels management specialists for each prescribed fire. These plans will be reviewed by park biologists, botanists, and archaeologists to ensure protection of sensitive resources. Consultation under Section 106 of the National Historic Preservation Act or Section 7 of the Endangered Species Act will be completed if needed. Projects with activities and effects not described in the Yosemite Fire Management Plan/ EIS require additional NEPA documentation. Additional NEPA documents may also be prepared for mechanical treatment projects in wildland/urban interface areas if potential environmental effects of the mechanical methods are not well understood or in need of further analysis.

## **2. Section 7 of the Endangered Species Act (ESA)<sup>1</sup>**

The Federal Endangered Species Act of 1973, as amended, requires federal agencies to consult with the USFWS before taking actions that could: jeopardize the continued existence of any federally listed plant or animal species or species proposed for listing; or could result in the destruction or adverse modification of critical or proposed critical habitat.

There are four plant species known to occur in Yosemite National Park and/or the El Portal Administrative Site have been listed as “rare” by the State of California: Yosemite onion, Thomson’s sedge, Congdon’s woolly-sunflower, and Congdon’s lewisia (**Table 3.5**). These species are considered restricted and limited throughout all or a significant portion of their range, and may represent disjunct populations at the extremes of their range. The [Natural Resources Management Guidelines \(NPS-77\)](#) state that the identification of a plant as a rare species warrants heightened management concern. In the study area, these four plants are at lower elevations in the Lower Montane and Foothills Woodlands vegetation zones- mainly in and near El Portal.

There are six federal Species of Concern (not listed but tracked by the USFWS). In addition, 103 ‘park rare’ species have limited distribution in Yosemite but are not necessarily limited in their range. These are tracked by the park although they are not listed as endangered or threatened. They are not included for analysis in this section.

There are ten state and federal listed threatened or endangered animal species in Yosemite National Park (Appendix C). In addition, there are four species that are proposed for listing. These species are known to be or could be present in Yosemite National Park or the El Portal Administrative Site and therefore could be affected directly by any potentially altering landscape action.

## **3. Section 106 of the National Historical Preservation Act (NHPA)<sup>2</sup>**

Section 106 of the federal National Historical Preservation Act of 1966 (NHPA), as amended, most directly drives the process necessary to facilitate compliance in conjunction with fire management. Section 106 of the NHPA, as amended, states that:

“The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking...shall, prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.”

Fire Management activities are considered undertakings under the following definition:

Undertaking means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and those subject to State or local regulation administered pursuant to a delegation or approval by a Federal agency. (cf. 36 CFR 800.16(y)).

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<sup>1</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Affected Environment, Section III-21

<sup>2</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Protection of Sensitive Resources; X-7 Figure 1, Section 106 NHPA

The Section 106 process, however, can be a time-consuming one, potentially stretching over 120 days, a timeframe that does not mesh well with the needs of Fire Management (Jackson 2003). The standardized process described in the remainder of the document however, allows an accelerated compliance process, by facilitating the implementation of a Programmatic Agreement (PA) between Yosemite National Park, the California State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, and consulting tribal partners. Under Stipulation II of the PA, Applicability, Yosemite may apply the agreement to all individual actions relation to specific management plans such as the Fire Management Plan. In the event that Yosemite determines an adverse effect, standard mitigation measures outlined in the PA, recordation, salvage, interpretation or National Register reevaluation, can be applied.

## **E. LEGISLATIVE AUTHORITY**

Authority for the Yosemite Fire Management Plan is based on the Organic Act of the National Park Service (August 25, 1916). The Organic Act states that the National Park Service *will preserve and protect natural and cultural resources under its jurisdiction so they are left unimpaired for the enjoyment of future generations*. Other authorities for the Yosemite Fire Management Plan include: 16 U.S.C. 1 through 4 and delegations of authority in Part 245 of the Departmental Manual; 31 U.S. Code 665 (E) (1)(B), which allows exceedance of appropriations because of wildland fire management activities; Section 302(c)(2) of the Federal Property Administration Act of 1949, as amended; Chapter VIII of the 1983 Supplemental Appropriations Act (P.L. 97-257), which addresses fire protection contracts; Reciprocal Fire Protection Agreement Act, May 27, 1955 (U.S.C. 1856), which allows federal, state, and local fire agencies to enter into reciprocal wildland fire protection agreements.

## **II. RELATIONSHIP TO POLICY AND LAND MANAGEMENT PLANNING**

### **A. CURRENT NPS MANAGEMENT POLICIES AS IT PERTAINS TO FIRE MANAGEMENT:**

Wildland fire management activities conducted by the National Park Service are guided by the following management policies:

[The National Park Service Management Policies, August 31, 2006](#)

[United States Department of the Interior, Departmental Manual](#)

[Director's Order 18](#)

[Interagency Standards for Fire and Fire Aviation Operations](#)

[National Interagency Mobilization Guide](#)

[Interagency Incident Business Management Handbook](#)

[Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide](#)

[Wildland Fire Use Implementation Procedures Reference Guide](#)

[Interagency Fire Program Management Qualifications Standards and Guide](#)

[Yosemite National Park General Management Plan \(NPS 1980\)](#)

[NPS Management Policies \(2006\)](#)

Natural and Cultural Resource Management Plan (or Resource Stewardship Strategy)

The Final Yosemite Fire Management Plan is in compliance with each policy.

## **B. ENABLING LEGISLATION AND THE PURPOSE FOR ESTABLISHING YOSEMITE NATIONAL PARK**

### **1. The Establishment of Yosemite National Park**

Yosemite National Park was established and is managed in accordance with a series of laws, regulations, and executive orders. On June 30, 1864, Yosemite Valley and the Mariposa Big Tree Grove were granted to the State of California by the federal government to “be held for public use, resort, and recreation” to be “inalienable for all time.” On October 1, 1890, Congress passed an act establishing Yosemite National Park as a “forest reservation” to preserve and protect “from injury, all timber, mineral deposits, natural curiosities, or wonders” within the park area, and to retain them in their “natural condition.” The act excluded Yosemite Valley and the Mariposa Big Tree Grove, leaving them under the jurisdiction of the State of California, as provided for in the 1864 act. A joint resolution of Congress on June 11, 1906 accepted the transfer of Yosemite Valley and the Mariposa Big Tree Grove from the State of California to the federal government as part of Yosemite National Park. Two primary purposes for Yosemite National Park were established in the 1864 act and subsequent legislation. They are:

- To preserve the resources that contribute to Yosemite’s splendor and uniqueness, including its exquisite scenic beauty, outstanding Wilderness, and a nearly full diversity of Sierra Nevada environments
- To make the varied resources of Yosemite available to people for their enjoyment, education, and recreation—now and in the future.

In 1958, Congress passed legislation for the Secretary of the Interior to provide an administrative site for Yosemite National Park in the El Portal area (16 USC 47-1). The El Portal Administrative Site is under National Park Service jurisdiction, but is not included as part of Yosemite National Park.

In 1984, 95% of Yosemite National Park was designated Wilderness under the California Wilderness Act. In the same year, the international importance of Yosemite National Park was recognized by the World Heritage Committee in its designation as a World Heritage Site.

### **2. Significant Resources and Values of Yosemite National Park**

Yosemite National Park occupies about 1,170 square miles, or 748,955 acres, on the western slope of the Sierra Nevada, the highest and most continuous mountain range in California. The Sierra Nevada runs half the length of the state, dividing the Central Valley of central and northern California from the arid, western edge of the Great Basin to the east. Yosemite National Park lies within three counties—Mariposa, Tuolumne, and Madera— and abuts a fourth, Mono. The park shares boundaries with the Stanislaus, Sierra, Inyo, and Toiyabe National Forests. Ninety-four percent of the park (about 704,624 acres) is designated Wilderness.

Elevations in the park rise to 13,114 feet, near the eastern boundary, and drop to 2,127 feet at the western boundary. This wide elevation range supports a variety of environments, each with distinct climatic conditions, vegetation, and animal life. Yosemite, like much of California, has a Mediterranean climate. Cool, moist winters and hot, dry summers prevail. The extreme differences in elevation and terrain affect both temperatures and precipitation. At higher elevations, most of the precipitation falls as snow.

Elevation and weather patterns result in large scale vegetation zones along the north-south axis of the Sierra. On the west side, forest types change with increasing elevation from live oak to mixed conifer to mountain hemlock and pine at high elevations. Straddling the crest of the Sierra Nevada is a zone of subalpine and alpine vegetation. Secondary vegetation patterns are created by deep river canyons and east-west orientation of watersheds that drain the Sierra Nevada. The range contains the headwaters of 24 major east-west river basins, two of which are in the park— the Merced and the Tuolumne Rivers.

Humans have been a part of the Sierra Nevada ecosystems for at least 10,000 years. Numerous, distinct American Indian cultures were widely distributed throughout the region well before settlement by Euro-Americans in the mid-19<sup>th</sup> century. Although the record is incomplete, archaeological evidence indicates that, prior to the 1850s; the American Indian population in the Sierra Nevada may have been as large as 90,000 to 100,000 people (Anderson and Moratto, 1996).

### C. GOALS AND OBJECTIVES OF YOSEMITE NATIONAL PARK'S GENERAL MANAGEMENT PLAN

Planning in Yosemite National Park takes two different forms: general management planning and implementation planning. General management plans are required for national parks by the National Park and Recreation Act of 1978. Implementation plans, which tier off of general management plans, focus on "how to implement an activity or project needed to achieve a long-term goal" (DO 2, NPS 1998). Yosemite National Park's *General Management Plan*, completed in 1980, is the foundational document for managing the park.

Yosemite National Park's *General Management Plan* outlines five goals:

- Reclaim priceless natural beauty;
- Markedly reduce traffic congestion;
- Allow natural processes to prevail;
- Reduce crowding; and
- Promote visitor understanding and enjoyment

Furthermore, the *General Management Plan* outlines several objectives related to fire management activities to reach these goals.<sup>3</sup> With respect to the *General Management Plan*'s goal of allowing natural ecosystem processes to prevail, it recognizes that "controlled burns or mechanical removal of vegetation" may be needed to simulate the natural role of fire. The plan also calls for protecting the safety and security of all visitors and employees.

### D. GOALS AND OBJECTIVES FROM THE CULTURAL AND NATURAL RESOURCE MANAGEMENT PLAN

The *Resources Management Plan* for Yosemite National Park was updated in 1993. It describes the natural and cultural resource management programs needed to accomplish the legislated mandates of the National Park Service and Yosemite National Park and apply the policies, program emphases, and provisions of related planning documents. The *Resources Management Plan* identifies the need for fire management programs and includes project statements specific to fire management, the restoration and maintenance of natural ecosystems and ecosystem processes, and the maintenance and protection of cultural resources. It also recognizes the need for fuels reduction in areas with buildings and other development (wildland/urban interface).

### E. GOALS AND OBJECTIVES FROM THE MERCED WILD AND SCENIC RIVER COMPREHENSIVE MANAGEMENT PLAN

[This Merced Wild and Scenic River Comprehensive Management Plan \(February 2001\)](#) presents the plan for the Merced River as adopted by the National Park Service following the release of the [Merced Wild and Scenic River Comprehensive Management Plan/Final Environmental Impact Statement \(June 2000\)](#) and the associated [Record of Decision \(November 2000\)](#). The Merced Wild and Scenic River Comprehensive Management Plan derives its authority from the 1968 Wild and Scenic Rivers Act. It amended certain specifics of the General Management Plan, but it did not alter its five broad goals. The Merced Wild and Scenic River Comprehensive Management Plan provides the basis for preserving and maintaining the Outstandingly Remarkable Values of the Merced Wild and Scenic River and outlines the following set of goals for management of the Merced Wild and Scenic River:

- Protect and enhance river-related natural resources;
- Protect and restore natural hydrological and geomorphic processes;
- Protect and enhance river-related cultural resources;
- Provide diverse river-related recreational and educational experiences;
- Provide appropriate land uses.

As a result of a 2004 court ruling, the National Park Service has prepared the [Merced Wild and Scenic River Revised Comprehensive Management Plan and Supplemental Environmental Impact Statement \(Revised Merced River Plan/SEIS\)](#). This plan revises the June 2000 Merced Wild and Scenic River Comprehensive Management Plan and Final Environmental Impact Statement (Merced River Plan/FEIS). The specific purpose of this document is to address user capacities in the Merced River corridor, reassess the river boundary in El Portal, and amend the park's General Management Plan.

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<sup>3</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Table 1-3



## F. VEGETATION MANAGEMENT PLAN FOR YOSEMITE NATIONAL PARK (1997)

This plan established broad objectives for the management of vegetation in the park. It describes the dynamic environment of park vegetation, discusses vegetation management issues, and identifies management strategies and techniques for achieving general desired conditions for the various plant communities in the park. One such strategy includes managing fire regimes. In this way, the Vegetation Management Plan sets general direction for the Yosemite Fire Management Plan/EIS. From this general direction are developed a range of fire management activities, such as the multi-year prescribed fire schedule (Appendix I) and more specific target conditions for plant communities (**Tables 1 & 2**).

## G. MEETING THE OBJECTIVES OF THE GENERAL MANAGEMENT PLAN AND RESOURCE MANAGEMENT PLAN THROUGH THE FIRE MANAGEMENT PLAN

The 2004 *Yosemite Fire Management Plan Final EIS* is an implementation plan derived from the collective goals of Yosemite's enabling legislation, General Management Plan, Resource Plan and all other plans which direct park operations and activities.

The *Fire Management Plan Final EIS* was designed to present several alternatives to implement National Park Service and federal wildland fire policies in the Project Area ([Map 1-1](#)). In compliance with federal planning processes, an overall goal in preparing the *Fire Management Plan Final EIS* was to develop the plan with consideration of the views and thoughts expressed by many citizens with a deep regard for the park.

The chief differences between the 1990 version of the Fire Management Plan and the 2004 EIS are scale and tools. The decision to prepare an Environmental Impact Statement rather than an Environmental Assessment for this plan was likewise based on appreciation that to more fully meet the goals of the federal fire policy, the Yosemite fire management program would need to treat more areas at a faster rate with a greater variety of management strategies than had been employed in the past.

The *EIS* and this annually-approved *Operational Yosemite Fire Management Plan* support the fire management-related provisions of Yosemite National Park's [General Management Plan and Resource Management Plan](#) by:

- Reducing the risk of catastrophic fire, especially near the wildland/urban interface (communities, government and commercial buildings, and other developed areas), while continuing to reverse the adverse effects from past fire suppression and prevention activities;
- Executing a fire management program that provides a safe environment for firefighters and the public, including safe operations at fire management related facilities (e.g., helibases, fire camps, fire stations);
- Providing a plan that is consistent with National Park Service wildland fire management policy and that adheres to guiding principles from the 1995 Federal Fire Policy, which recognizes the following:
- Firefighter and public safety is the first priority in every fire management activity
- Wildland fire is an essential natural process

# III. WILDLAND FIRE MANAGEMENT STRATEGIES

## A. GENERAL MANAGEMENT CONSIDERATIONS

The 2009 Yosemite Operational Fire Management Plan supports the primary goals of the 10-Year Comprehensive Strategy described in [A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment](#). The primary goals of the 10-Year Comprehensive Strategy are:

- Improve prevention and suppression;
- Reduce hazardous fuels;
- Restore fire adapted ecosystems; and
- Promote community assistance



The Yosemite National Park wildland fire program, therefore, will conduct wildland fuel reduction activities near the six identified wildland/urban interface communities of Hodgdon Meadow, Foresta, Yosemite Valley, El Portal, Wawona, and Yosemite West with prescribed fire and mechanical treatment methods. Although Aspen Valley was not identified in the EIS, 2004; it is here identified as another wildland fuel reduction area. These projects will be developed in collaboration with local homeowner groups, and will include the use of contracts with private companies,. The restoration of fire adapted ecosystems may take 20 years or longer. This goal will be met through the full range of response to wildland fire, prescribed fire, and mechanical methods.

This program will utilize the full range of response to wildland fire to manage all fires in a safe and cost-effective manner considering both impacts and enhancement to natural and cultural resources.

## **B. WILDLAND FIRE MANAGEMENT GOALS**

The Yosemite Fire Management Plan describes a detailed program of actions to carry out fire management policies and objectives in Yosemite National Park and El Portal Administrative Site. The fire management goals and objectives have their foundations in the park's guiding management documents. Each goal has a set of related management objectives. These may evolve during implementation of the fire management program, as part of the adaptive management process to which the fire management program adheres.

The following goals provide the programmatic direction for the wildland fire program. The goals have been stated within the context of the approved land and resource management plan direction. Furthermore, this section describes how the Fire Management Plan will safely and effectively contribute to achieving the goals in the approved land and resource management plan.

Yosemite Fire Management Plan GOALS and OBJECTIVES<sup>4</sup>

### **GOAL: ENSURE FIREFIGHTER AND PUBLIC SAFETY**

The protection of firefighters and the public is the first priority in every fire management activity and during all phases of the fire management program.

#### **Fire Management Objectives:**

- Plan and carry out all other activities consistent with and subordinate to safety considerations;
- Provide the fire management workforce with the training, equipment, operating procedures, safety measures, and information needed to manage risks and carry out their activities safely;
- Identify, inform, and protect visitors, communities, other groups, and individuals that potentially would be affected by fire management activities. Reference a schedule reaching each entity repeatable every 2, 3, or some number years;
- Manage response to wildland fires within designated areas or management units using the most current planning and risk assessment techniques available;
- Establish a Suppression FMU comprised of areas where wildland fire would have a high potential to compromise firefighter and public safety, threaten property, or violate air quality laws or regulations and where prescribed fire and other fuel reduction treatments could be used to reduce risks and accomplish resource management goals; and
- Establish a Fire Use FMU to include areas where response to wildland fire could be managed to accomplish resource management goals in a way that did not compromise firefighter and public safety, threaten property, or violate air quality laws or regulations.

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<sup>4</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Purpose and Need, Section I

**GOAL: IMPLEMENT A FIRE PROGRAM THAT ALLOWS THE NATURAL PROCESS OF FIRE TO PREVAIL IN THE YOSEMITE WILDERNESS**

The natural interactions between fire and the environment should influence the type, abundance, and distribution of plants and animals in the park. A crucial goal of Yosemite's fire management program is to restore or maintain natural fire regimes so that ecosystems can function essentially unimpacted by human interference. In areas showing adverse effects from fire suppression, restoration of forest structure and reduction of fuel loads will allow natural processes to resume and reduce the risk of unwanted, high-intensity wildland fires that might cause undesirable changes in forest type and threaten human lives or property.

**Fire Management Objectives:**

- Manage ecosystems within the natural range of variability for plant community structure and fuel loads;
- Ecosystems that are within the range of maintenance target conditions (see **Table 2**) should be maintained through natural processes (naturally caused and re-ignited wildland fire), within the constraints of policy;
- Ecosystems that are not within the range of natural variability should be restored to restoration target conditions (**Table 1**) and subsequently maintained through natural processes, within the constraints of policy;
- Mechanical fuel treatment methods will be used in wildland/urban interface areas where the use of prescribed fire or response to wildland fire is not practical for ecosystem restoration because of safety or smoke concerns. Even in these areas, however, prescribed fire will be used as fully as possible to maintain the natural range of variability once more natural fuel conditions have been restored mechanically;
- Avoid adverse impacts to special-status species and their habitat from fire management activities, unless cleared in advance through the appropriate regulatory process; and
- Set priorities for treatment activities based on site-specific information on departure from natural fire return interval, target conditions, and other relevant factors.

**GOAL: MANAGE SPECIAL MANAGEMENT AREAS FOR SPECIFIC PURPOSES AS MANDATED BY POLICY, SAFETY, OR OTHER REGULATIONS**

The fire program goals will be modified somewhat in and near the wildland/urban interface, in the giant sequoia groves, and near boundary areas because these areas are unique. These three areas will hereafter be referred to as Special Management Areas.

**Fire Management Objective:**

Adhere to goals and objectives specific to each of the following three Special Management Areas:

**SPECIAL MANAGEMENT AREA: WILDLAND/URBAN INTERFACE**

Reduce the risk of wildfire catastrophically impacting communities and developed areas. In Wawona, Foresta, Yosemite Valley, Yosemite West, Hodgdon Meadow, and El Portal, the goal is to use fire management treatments, including mechanical fuel reduction methods, to reduce the risk of wildfire, while restoring plant community structure. Over the coming years the Fire Management Plan will embrace and implement the utilization of new technologies such as hauling biomass, utilizing an air curtain destructor, etc.

**Fire Management Objectives:**

- Restore ecosystems to at least the upper end of the range of restoration target conditions (see **Table 1**) to promote fire tolerant plant communities and create defensible space. This should reduce risks and improve the manageability of fire;
- Forest fuels should be reduced within developed areas by thinning trees and removing underbrush and dead wildland fuels;
- Prescribed fire and other treatments should be used to provide optimum protection;
- Thinning protocols and size of trees removed will follow guidelines described in the Sierra Nevada Framework;
- Enforce the California fire laws and regulations; and
- Base priorities for treatment activities on hazard risk analysis, departure from natural fire return interval target conditions, and other relevant information for each community.

### **SPECIAL MANAGEMENT AREA: *GIANT SEQUOIA GROVES***

Balance the restoration of natural process with the desire to preserve prime scenic and biological values. Preservation, restoration, and maintenance of the giant sequoia groves are the primary considerations.

#### **Fire Management Objectives:**

- Maintain natural giant sequoia groves, with a range of tree ages and site conditions characteristic of those in fire-maintained ecosystems; and
- Preserve scenic values, including open views of the groves, without interfering with the restoration or simulation of a lightning fir regime.

### **SPECIAL MANAGEMENT AREA: *BOUNDARY AREAS***

Simulate natural fire regimes along the National Park Service boundary. In most areas along the western park boundary, the goal is to simulate natural fire regimes in perpetuity. In areas where other agencies have goals similar to those in Yosemite National Park, collaboration might include a mutually acceptable range of treatment options.

#### **Fire Management Objectives:**

- Keep wildland fire within park boundaries if agreements with adjacent agencies have not been worked out; and
- If agreements have been or can be developed with other land management agencies, allow wildland fires to move across boundaries to meet goals of interagency fuel reduction and ecosystem restoration projects.

### **GOAL: ALLOW FIRE TO BE USED AS A TOOL FOR SPECIAL RESOURCE MANAGEMENT PROJECTS**

There are numerous areas that may be sustained or helped by fire. For example, fire helps maintain meadows, scenic areas, cultural landscapes, and plant communities used by American Indians. In addition, it can discourage invasion by non-native plants. From a cultural stance, it has also exposed cultural resource archeological sites.

#### **Fire Management Objective:**

- Use fire as a tool on special projects, consistent with the management objectives of the project plan, in collaboration with the proposing division.

### **GOAL: MINIMIZE IMPACTS TO CULTURAL RESOURCES**

This goal recognizes that archaeological and historical sites, ethnographic resources, and cultural landscapes are more at risk when heavy fuel loads burn than when frequent fires burn in light fuel accumulations.

#### **Fire Management Objectives:**

- Perpetuate natural fire processes to maintain light fuel loads on and adjacent to archaeological sites and historic structures;
- Protect significant cultural resources from adverse impacts of fire and fire management practices, to the extent feasible;
- Develop project protocols, through adaptive management, for using fire and other treatments to maintain the setting at historic sites and to maintain the integrity of other cultural resource sites; and
- Consult and coordinate with American Indian groups to ensure the protection of traditional cultural resources.

**GOAL: USE THE ADAPTIVE MANAGEMENT PROCESS TO EFFECTIVELY INCORPORATE SCIENTIFIC KNOWLEDGE AND MONITORING AND EVALUATION RESULTS**

The adaptive management cycle includes the development of a plan with stated goals and objectives, means of carrying out the planned actions, monitoring of the results, evaluations of the outcome of the actions, and the use of hypothesis testing to refine prescriptions and methods.

**Fire Management Objectives:**

- Conduct research that will help to understand the natural fire regimes, refine prescriptions, provide data for fire behavior models, and effectively implement the fire management program;
- Monitor and evaluate fire management activities (response to wildland fire, prescribed burns, and fuel reduction treatments), to assess their effects on natural and cultural resources and Special Management Areas; and
- Update fire return interval departures, target conditions, prescriptions, and fire treatment priorities, as data becomes available.

**GOAL: EDUCATE, INFORM, CONSULT, AND COLLABORATE WITH STAKEHOLDERS**

**Fire Management Objectives:**

- Conduct wildland fire prevention, information, education, and other activities in communities within (which communities, when and how often would make this measurable) and adjoining the park. Work in collaboration with local communities, county, state, and federal fire agencies with fire management interests;
- Develop interpretive displays and educational programs, working with the Division of Interpretation, to foster understanding and acceptance of the fire management program. How many, when would make this measurable;
- Maintain relationships with the American Indian community, to encourage their participation in the management of traditional gathering areas. Facilitate the transfer of knowledge about fire management and traditional cultural practices. Number of meetings per year, when and who would make this measurable; and
- Collaborate with county and state air resources agencies to monitor smoke levels and manage smoke-related effects on visitors, residents, and employees.

**GOAL: CONDUCT A FIRE MANAGEMENT PROGRAM BASED ON EXISTING POLICY AND IN COMPLIANCE WITH FEDERAL AND STATE REGULATIONS**

It is the goal of the National Park Service that the activities described in the Yosemite Fire Management Plan are consistent with and implement existing National Park Service and federal wildland fire management policies and related federal regulations. This includes policies and regulations that provide direction about human safety, protection of property, coordination and communication with other agencies and jurisdictions, use of science, preparedness, suppression, prevention, and standardization of procedures.

**Fire Management Objective:**

Implement a fire management program that is compliant with National Park Service and federal wildland fire management policy and applicable regulations.

**C. WILDLAND FIRE MANAGEMENT OPTIONS**

This section displays the scope of wildland fire management program elements that will be implemented within the administrative unit and further developed through the fire management plan. The section below contains new wildland fire type descriptions a brief rationale for all wildland fire management components that are to be implemented and how they relate to land and resource plan direction.

Wildland Fire: Any non-structure fire, that occurs in the wildland. Two distinct types of wildland fire have been defined and include planned ignitions (prescribed fire), and unplanned ignitions (wildfire). The [Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy \(June 2003\)](#) defined three different types of wildland fire, however use of the full range of response allowed under the revised Federal Fire Policy implementation guidelines amends that document and leaves only the two types of wildland fire defined below:

**Wildfire:** A wildland fire initiating from an unplanned ignition

**Prescribed Fire:** A wildland fire initiating from a planned ignition

In the 2004 EIS, prior to the aforementioned policy revisions, the park was divided into two Fire Management Units (FMUs) ([Map 2-20](#)): Fire Use FMU and Suppression FMU. With the elimination of wildland fire use, as a separate type of wildland fire managed with a different planning process, having two FMUs is less important. Park fire managers intend to take advantage of the more flexible range of response and management of fires afforded by the change in policy. There is no expected change to management of the Fire Use FMU. There, managers will continue to utilize the full range of response to wildland fire for resource benefit, using wildfires as the principle tool to meet the Target Conditions detailed in the EIS. In the Suppression FMU, managers will continue to use mechanical fuel reduction and prescribed fire as the principle tools for meeting EIS Target Conditions, while managing for public safety objectives on wildfires.

Statements were made in the EIS that expressly prohibit the use of fire for resource benefit in the Suppression FMU that would otherwise be allowed under the new policy implementation. Therefore, consultation with park and regional planners and compliance officers will be conducted to see whether the removal of existing prohibitions constitute substantial change in outcomes and effects. Substantial differences in expected outcomes may require additional revision and/or compliance actions.

## D. NPS UNIT DESCRIPTION OF GENERAL PHYSICAL AND BIOTIC CHARACTERISTICS

### 1. Physical and Biotic Characteristics of Yosemite National Park<sup>5</sup>

All fire, whether natural or human-caused, changes the cycling of nutrients and the biotic and physical characteristics. The magnitude and longevity of these effects depend on many factors including fire regime, severity of a particular fire, vegetation and soil type, topography, season of burning, and pre- and post- fire weather conditions. Effects can also be indirect, through changes in soil biota and changes in erosional rates. Sites that historically had frequent fires are generally better adapted to the reintroduction of fire and repeated burning.

### 2. Physical Characteristics

#### **Geology**

The general geological story of the Sierra Nevada can be considered in two parts: the deposition and formation of sedimentary and volcanic rock over a period of hundreds of millions of years and the intrusion of granitic rocks, and (2) the uplift, erosion, and glaciation of the environment to form today's landscape (Huber, 1989).

#### **Soil**

More than 50 soil types exist within the park; general or local variations depend on glacial history and the ongoing influences of weathering and stream erosion and deposition. Topography influences surface water runoff, groundwater, distribution of stony soils, and the separation of alluvial soils (Zinke and Alexander, 1963). Local variations also result from differences in microclimates due to aspect and major vegetation types. Soils of the Yosemite region are primarily derived from underlying granitic bedrock and are of similar chemical and mineralogical composition. Except for meadow soils, most soils at high elevations were developed from glacial material or developed in place from bedrock.

#### **Water**

An inventory of water quality in Yosemite revealed excellent water quality in most of the park, although some water quality degradation is occurring in areas of high visitor use (NPS 1994). Water quality is generally above state and federal standards. The surface water quality of most park waters is considered valuable by the State of California for wildlife and freshwater habitat and recreation.

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<sup>5</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Affected Environment and Environmental Consequences (Alternative D), Section III and IV

## ***Air***

Yosemite National Park is classified as a mandatory Class I area under the Federal Clean Air Act (42 USC 7401 et seq.). This most stringent air quality classification is aimed at protecting national parks and Wilderness areas from air quality degradation. The Act gives federal land managers the responsibility for protecting from adverse air pollution impacts on air quality and related values, including visibility, plants, animals, soils, water quality, cultural and historic structures and objects, and visitor health.

### **3. Biotic Characteristics**

#### ***Vegetation***

The vegetation of Yosemite National Park is varied and complex. At least 1,374 vascular plant species and numerous bryophytes and lichens occur in the park (NPS 1997a). Yosemite's forests include three world record trees: the largest red fir and white fir, and the world's tallest pine tree- a sugar pine. Approximately 54% of Yosemite supports high quality, late successional forest (Franklin and Fites-Kaufmann, 1996). A number of species are considered globally or locally rare. The park has five plants that are species of concern, no federally listed plant species, four State of California listed species, and 109 special-status plant species (Appendix C).

#### ***Wildlife***

Wildlife in Yosemite National Park is diverse and abundant, reflecting the wide range of Sierra Nevada habitats and vegetation types that are in relatively intact condition (Table 3.4). Areas of concentrated human use in Yosemite and the El Portal Administrative Site have affected wildlife and their habitats, primarily by displacing animal populations that may have once been much more abundant. Fire suppression for over 70 years has significantly impacted habitat, also affecting wildlife populations.

Specifically, approximately 85 native mammal species in six families inhabit Yosemite. Of the insectivore family, five shrews and one mole live here. Seventeen species of bats inhabit the forests and cliffs of Yosemite; nine are either California species of special concern or federal species of concern. Approximately 150 species of birds regularly occur in the park, and about 80% of these are known or suspected to breed here. In addition, compared to most mountain regions of the west, Yosemite has a large number of native reptile and amphibian species: 14 snakes, 7 lizards, 1 turtle, 2 toads, 1 tree frog, 3 true frogs, and 5 salamanders. Most fish inhabiting Yosemite's waters have been introduced. Prior to trout stocking for sport fishing, native fish were limited in both range and number of species.

### **4. Historic Role of Fire in Yosemite National Park<sup>6</sup>**

The Sierra Nevada has a high incidence of lightning fires. Over the past 30 years, in Yosemite National Park, lightning has started an average of 55 fires, or 83 fires per million burnable acres each year (NPS 1990). Tens of thousands of acres have burned in some years, while in other years only a few acres have burned. It is conservatively estimated that an average of 16,000 acres per year may have burned under natural conditions in the park. This average is equivalent to 2.4 % of the park's burnable vegetation every year. Additional acres were periodically burned by American Indians in Yosemite Valley and other areas. These fires affected the amount and types of vegetation in those areas- both of which, in turn, influence fire incidence and behavior.

With this said, fire has played a historic role in Yosemite National Park for centuries. All vegetation that can sustain a wildland fire in Yosemite National Park will and has burned from time to time. As a result, plants and plant communities exist within a cycle of burning and growth. Between burns, the structure of the forest changes as the smaller plants beneath the tree canopy grow larger and some plants out-compete or out-grow others. Some plant communities sustain fires that mainly burn the undergrowth and leave most of the overstory trees unharmed. Other communities, like lodgepole pine, must accumulate enough fuel to sustain larger, more intense fires, commonly called stand replacement fires.

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<sup>6</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Purpose and Need, Section I

Some areas have burned more frequently than others. Fire tends to move through ponderosa pine/bear clover forests often, about every two to six years, creating an open understory while leaving the larger, fire-resistant trees. On the other hand, in red fir forests, which may burn frequently or may not be visited by fire for decades, the range for fire frequency is wide, from 5 to 70 years. The return of fire can vary greatly depending on forest type; time between natural fires is expressed as a range and is the fire return interval.

The American Indians whom occupied the Sierra Nevada utilized fire as their most important management tool. Fire was most commonly used in the foothill woodland, chaparral, mixed conifer, riparian corridors, and meadow vegetation types. Generally fire was used “to clear brush, maintain grasslands and meadows, improve browse for deer, enhance production of basketry and cordage materials, modify understory species composition in forests, and reduce fuel accumulation that might otherwise sustain intense fires” (Anderson and Moratto, 1996). Fire was used to foster desirable attributes in certain plants and “individual shrubs or clusters of shrubs were burned to manipulate the place architecture and keep the plants insects and pathogen-free” (Anderson, 1993).

The combination of the frequency, extent duration, behavior, season, and effects of natural fire that typically would burn within a specific landscape is known as a fire regime. In Yosemite, administrative fire records date back to 1930, and additional records have been found to date back to the 1920s. Thus, managers at Yosemite have 80 years of records on fire and fire suppression activities on which to rely, in addition to even earlier anecdotal information. Furthermore, tree ring studies provide a history of fire frequency sometimes dating back hundreds of years.

## **5. Long-Term Effects of Fire Suppression on Yosemite’s Natural Resources**

In Yosemite National Park, fire has been largely suppressed since the 1920s, and in some areas, fire has been suppressed since the mid-19<sup>th</sup> century. In these areas of decades-long fire suppression, vegetation types that have short fire return intervals have missed several fires and show a large deviation from natural conditions. This means that wildland fuel has accumulated and forest density has increased to dangerous levels.

Specifically, natural plant community succession, species composition, and forest structure have been altered because the National Park Service suppressed wildland fires for decades. These changes are most pronounced in the oak woodlands, ponderosa pine/mixed-conifer, and white fir/mixed-conifer communities. The forest canopy is becoming increasingly closed and forest openings smaller as shade tolerant species grow in dense thickets. Fewer grasses, forbs, and shrubs grow in the remaining openings. Small trees are also encroaching on meadows that once would have been maintained by frequent fires.

In addition to the obvious vegetation changes due to decades of fire exclusion, subtle but important hydrological changes may have occurred because of this increased forest growth. Decreased runoff and infiltration may have altered the water table around meadows, helping to accelerate tree invasion. It is also acknowledged that the late 19<sup>th</sup> century removal of part of Yosemite Valley’s terminal moraine by early Euro-Americans altered the hydrologic regime of the Valley. All of these changes have, in turn, caused a deterioration in the habitat favored by many forms of wildlife, and therefore in the value of the ecosystem to the park visitor as a “vignette of primitive America” (Leopold et al. 1963).

Lack of fire has changed habitat that is critical for certain wildlife species. When the number and extent of forest openings, or gaps, is reduced as forest density increases due to fire suppression, key shade-intolerant herbaceous and shrub species (particularly nitrogen fixers such as ceanothus) are also diminished (Bonnicksen and Stone 1982). Wildlife that depend on these plants, such as deer, have less available habitat.

Other species are dependent on fresh, fire-created snags such as the black-backed woodpecker. These species may suffer a dramatic decline in the absence of fire. Lack of burning can also extend higher up the food chain. For example, rodents are less abundant in areas where fire has been excluded, resulting in a reduction in the carnivorous populations that depend on them.



The reverse of fire exclusion is the catastrophic effects from the inevitable reoccurrence of fire in ecosystems in which it has been suppressed for an unnaturally long period. The problems associated with vegetation changes that have increased the risk of uncontrollable wildland fires are especially prevalent at lower elevations. There, the natural mosaic of diverse vegetation types and ages is slowly being replaced by dense, continuous stands of shrubs and trees because of the success of fire suppression. Lower-elevation forests are susceptible to high-intensity wildland fire because of the increase in living and dead vegetation, both of which are fuel for fires.

The density of trees and shrubs has created a hazardous arrangement, both horizontally and vertically, of closely-standing, burnable vegetation, or fuel ladders, in the understory. Fuel ladders help fires ascend into the larger trees, or overstory. This combination of fuel ladders and a high density of fuels also increase the potential for insect and pathogen infestations, which, if they cause tree die-off, increase the potential for fire. In the event of catastrophic fire, whole landscapes can be denuded and reverted to shrub communities, watershed processes can be compromised, and other values can be gravely altered.

In the last two decades, the National Park Service has attempted to restore fire to many of these areas, especially in Wilderness. However, the present program has not been able to meet the needs of the whole park, especially in the areas contiguous with wildland/urban interface (WUI) communities.

## **E. DESCRIPTION OF WILDLAND FIRE MANAGEMENT STRATEGIES BY FIRE MANAGEMENT UNIT (FMU)**

Yosemite is divided into two fire management units ([Map 2-20](#)): the Fire Use FMU (83% of the park), and the Suppression FMU (17% of the park). Fuels in and near the wildland urban interface communities ([Map 1-2](#)) will be reduced over a period of 6 to 8 years and fire will be restored to park ecosystems in 15 to 20 years. Fuels will be reduced on up to 1,095 acres per year in the inner WUI (6,425 acres total) and will restore the natural fire regime by treating between 1,817 and 9,194 acres per year (31,503 to 160,894 acres total), with 100% of the vegetation in the Suppression FMU moved from Condition Class 3 to Condition Class 2 or 1 at the end of this period. FMUs have been generated and are stored as GIS compatible data and have been appropriately documented to NPS metadata standards.

Decision support processes and analysis that help determine and document decisions regarding the management of individual ignitions will follow current national direction. They may include processes such as the Wildland Fire Decisions Support System (WFDSS) and analysis tools such as Farsite, RERAP, and FSPRO. Many examples of past Wildland Fire Situation Analyses (WFSA) and Wildland Fire Implementation Plans (WFIP) exist in a digital format on the park server at U://Valley Protection/!Fire. The park fire GIS database resides at W://GISData/Fire

It should be noted that although the EIS describes the boundary between the Suppression FMU and Fire Use FMU, The Chief Fire Management Officer may sign off in the annual review to temporarily change that boundary, pending unusual seasonal weather and based on fire danger assessment in the spring. This change will be noted in the annual review, must be modified and approved by the Superintendent, and should be disseminated widely on maps, especially those used in the ECC.

### **1. Fire Use FMU (83% of the park)**

#### ***Non-Wildland/Urban Interface, Non-Wilderness***

There is very little development in this unit. These tracts are located mostly along road corridors and include Glacier Point, Tuolumne Meadows, White Wolf, and other areas where the Wilderness boundary is set back from existing human intrusions and development. Prescribed fire and thinning of small trees generally less than 6" dbh will be done to protect these areas as a wildland fire approaches. Hand cutting and pile burning will be used to prepare a prescribed fire unit for burning. Trees, including dead trees, will be cut as needed to provide safe and secure fire lines. These activities will be designed to reduce wildland fire intensity as fires approach non-Wilderness road and utility corridors. Point protection will be utilized around buildings or sensitive sites.

## **Wilderness**

Response to wildland fire, with a focus towards meeting resource management objectives, will be the primary fire management strategy used in Wilderness. Use of equipment will meet minimum tool requirements for Wilderness. Hand cutting and pile burning will be used to prepare units for prescribed fire or to protect them from approaching wildland fire. Prescribed fire plans will be prepared for work in designated burn units. The full range of response to wildland fire will be permitted anywhere in the Fire Use FMU pending authorization by the Park Superintendent of a planning document generated by a nationally defined analysis process (e.g. WFDSS), as appropriate.

## **Physical and Biotic Characteristics<sup>7</sup>**

### **Strategic and Measurable Fire Management Objectives**

In the *Fire Management Plan EIS* information on fire history and fire ecology was used to assess the current ecological condition of plant communities in the park and to develop a set of target conditions for vegetation and fuels. Target conditions were developed in conjunction with fire specialists at Sequoia and Kings Canyon National Parks (see below). Existing and target conditions were used to determine the appropriate type, amount, and location of fire management activities and the boundaries of fire management units in the action alternatives in this plan. The specific measurable objectives for both the Fire Use and Suppression FMUs include two components.

The first objective is to reduce high Fire Return Interval Departure (FRID)<sup>8</sup> values. High FRID values represent the highest risk to ecosystem health from a wildfire burning under extreme conditions and risk to adjacent values at risk. FRID is analogous to the Fire Regime Condition Class (FRCC) framework for describing the degree to which an ecosystem is outside of its historic range of variability, in terms of fire exclusion. For short fire return interval systems there is a strong correlation between high FRID or FRCC and fuel loading.

The second suite of measurable objectives for both FMUs is captured by the parks target conditions. *Target conditions* for vegetation and fuels in Yosemite have been established using information from a number of sources including scientific studies, monitoring data, and professional evaluations.

Target conditions describe vegetation in two ways: as a set of structural features for the vegetation types, and as a set of fire-related ecosystem processes that help sustain the vegetation types. For an extended description of target conditions see *the Fire Management Plan EIS*.<sup>9</sup> Target conditions are a range of monitoring variables that measure the effectiveness of program implementation.

In general, target conditions for restoration are based on plant community structure, while target conditions for maintenance are based on ecosystem processes. The general objectives for vegetation in fire management terms are to:

- *Restore* fire and a more natural ecosystem structure to plant communities that have missed more than three fire return intervals.
- *Maintain* plant communities that have missed less than four fire return intervals and are within, or close to, their natural range of variability.

Target conditions establish measurable objectives for the fire effects monitoring program are shown in the following tables:

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<sup>7</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Affected Environment and Environmental Consequences (Alternative D), Section III and IV

<sup>8</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Ecological Basis for the Alternatives, pg. II-5 to II-8.

<sup>9</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Ecological Basis for the Alternatives, pg. II-8 to II-15.

**Table 1. Restoration Target Conditions**

*Preliminary* target conditions by vegetation type for restoring plant communities by reintroducing the natural fire regime in Yosemite National Park. Restoration target conditions are based on structural features of vegetation types. Variables are number and size of forest openings or gaps, tree size, species composition, and amount of live and dead vegetative fuels.

Vegetation Type	Gap Distribution (gap size and % landscape) 1 ha = 2.47 acres	Density and Frequency by Species Composition (density: on stand level frequency: % of landscape)	Fuel Load (% of landscape)
	<i>Gaps smaller than 0.1 ha are difficult to detect. Gaps are based on consensus expert opinion from Sequoia and Kings Canyon National Parks and work from Lassen Volcanic National Park by Dr. Alan Taylor and will be refined for Yosemite as research and monitoring is accomplished. Numbers are relative percentage of gap size compared to all gaps.</i>	<i>DBH indicates diameter at breast height in inches. General guidelines are based on age/diameter relationships established for some species. Greater than 31.5 inches is assumed to be pre-settlement (generally established prior to latter half of 19<sup>th</sup> century). The smallest tree within the size range is considered to be 4.5 feet tall (i.e., breast height)</i>	<i>A complete lack of fuel in a measurable area occurs infrequently due to the patchiness of fire. Fuel bed depth, height to the base of live crown (canopy), and crown bulk density are not currently program goals; these inputs are needed to model crown fire potential or risk.</i>
<b>Red Fir Forest</b>	0.1-1 ha = 70-95% 1-10 ha = 5-30% 10-100 ha < (less than) 1% and 0-1% of the gaps < (are less than) 1 year old	20-202 trees/acre < (is less than) 31.5 inches <sup>1</sup> 4-30 trees/acre > (is greater than) 31.5 in <sup>2a</sup> and Composition is 70-100% fir + 0-30% pine <sup>2a</sup>	1-25% = (of the area has) 5-30 tons/ac 30-70% = 30-60 tons/ac 5-20% > (of the areas is greater than) 60 tons/ac
<b>Montane Chaparral</b>	Not Applicable – woodland/savannah type	4-61 trees/acre < 31.5 in <sup>1</sup> 2-20 trees/acre > 31.5 in <sup>2a</sup> Composition is 60-80% pine + 20-40% fir <sup>2a</sup>	1-30% = 5-30 tons/ac 25-75 = 30-60 tons/ac 5-20% > 60 tons/ac
<b>Giant Sequoia/ Mixed Conifer Forest</b>	0.1-1 ha = 75-95% 1-10 ha = 5-25% 10-100 ha < 1%	20-101 trees/acre < 31.5 in <sup>1</sup> 4-26 trees/acre > 31.5 in <sup>2</sup> Composition is 35-65% fir, 0-20% sequoia, 40-55% pine <sup>2</sup>	20-40% = 5-30 tons/ac 20-50% = 30-60 tons/ac 5-20% > 60 tons/ac
<b>White Fir/Mixed Conifer Forest</b>	0.1-1 ha are 75-95% 1-10 ha are 5-25% 10-100 ha < 1%	20-89 trees/acre < 31.5 in <sup>1</sup> 4-20 trees/acre > 31.5 in <sup>2</sup> Composition is 40-65% fir, 15-50% pine, 0-10% cedar <sup>2</sup>	20-40% = 5-30 tons/ac 20-50% = 30-60 tons/ac 5-20% > 60 tons/ac
<b>Ponderosa Pine/ Mixed Conifer Forest</b>	0.1-1 ha are 75-95% 1-10 ha are 5-25% 10-100 ha < 1%	4-91 trees/acre < 31.5 in <sup>1</sup> 4-30 trees/acre > 31.5 in <sup>2</sup> Composition is 60-95% pine, 15-40% cedar, 1-10% oak <sup>2</sup>	20-40% = 5-30 tons/ac 20-50% = 30-60 tons/ac 5-20% > 60 tons/ac
<b>Ponderosa Pine/Bear Clover Forest</b>	Will be determined through research and monitoring, i.e., through the adaptive management process. Application strategies would be revised and refined, using the results of monitoring and new research, to improve methods for achieving target conditions and expand monitoring objectives.		
<b>California Black Oak</b>			
<b>Canyon Live Oak Forest</b>			
Low Meadows/Dry Montane Meadows			
Foothill Pine/Live Oak/Chaparral Woodland	Lessons learned are documented in post-burn evaluation and factored into future prescribed burn plans.		
Blue Oak Woodland			

1. Based on consensus expert opinion for Sequoia and Kings Canyon National Parks; the smallest tree in the range would be 4.5 feet tall (i.e., breast height). 2. Based on fire effects monitoring data for 'pre-settlement' tree from Yosemite; additional databases may be available to refine targets. 2a. Sequoia and Kings Canyon National Parks fire effects monitoring data.

**Table 2. Maintenance Target Conditions**

*Preliminary* target conditions by vegetation type, for maintaining the natural fire regime within plant communities in Yosemite National Park. Maintenance of ecosystems is based on ecosystem process variables of fire return interval, seasonality of fire occurrence, and severity.

Vegetation Type	Fire Return Interval Range <sup>1</sup>	Season <sup>1</sup> (% of area burned)	Fire Size <sup>2</sup> <i>Largest natural fire recorded in type since 1930 through 2000.</i>	Fire Severity <sup>3</sup>	Fire Intensity <sup>4</sup> [British Thermal Unit (BTU)/ft/sec]
Assumptions:	<i>Distribution (and variation) is important.</i>	<i>Fires can <u>start</u> anywhere (including outside of vegetation type).</i>	<i>Indicative of natural fire behavior in higher elevations, and effects of fire suppression in lower elevations.</i>	<i>Severity = mortality of dominant vegetation</i>	<i>Percent of landscape</i>
<b>Whitebark Pine and/or Mountain Hemlock Forest</b>	4-508 years Median = 187 <i>l</i>	0-5% Jan-Jul 90-100% Aug-Oct 0-5% Nov-Dec	20 acres	Low 60-90% (surface) Mod 5-20% High 5-20% (single tree)	1-40 (mean = 10)
<b>Lodgepole Pine Forest</b>	4-163 years Median = 102 <i>j</i>	0-10% Jan-Jul 80-90% Aug-Oct 0-10% Nov-Dec	773 acres	Low 15-30% (surface) Mod 35-50% (surface) High 15-35% (crown?)	1-40 (mean = 10)
<b>Red Fir Forest</b>	9-92 years Median = 30 <i>l</i>	0-10% Jan-Jul 80-90% Aug-Oct 0-10% Nov-Dec	1,265 acres	Low 30-60% Mod 20-40% High 0-15%	1-120 (mean = 25)
<b>Western White Pine/Jeffrey Pine</b>	4-96 years Median = 12 <i>c</i>	Yet to be determined	3274 acres	Yet to be determined	20-1000 (mean = 100)
<b>Montane Chaparral</b>	10-75 years Median = 30 <i>k</i>	0-20% Jan-Jul 50-70% Aug-Sep 10-30% Oct-Dec	641 acres	Low 30-90% Mod 10-60% High 0-25%	1-60 (mean = 30)
<b>Giant Sequoia/Mixed Conifer Forest</b>	3-15 years Median = 10 <i>g</i>	0-20% Jan-late Aug 40-60% late Aug-Oct 30-50% Oct-Dec	Less than 1 acre	Lower slopes: 60-100% L, 5-35% M, 5-10% H Upper slopes: 0-35% L, 20-35% M, 30-90% H	20-1000 (mean = 100)
<b>White Fir/Mixed Conifer Forest</b>	3-35 years Median = 8 <i>f</i>	0-20% Jan-late Aug 40-60% late Aug-Oct 30-50% Oct-Dec	1,092 acres	same as above	Same as above
<b>Ponderosa Pine/ Mixed Conifer Forest</b>	3-14 years Median = 9 <i>e</i>	0-30% Jan-late Aug 50-70% late Aug-Oct 30-50% Oct-Dec	960 acres	Same as above	same as above
<b>Ponderosa Pine/ Bear Clover Forest</b>	2-6 years Median = 4 <i>d</i>	Yet to be determined through the adaptive management process.	1,247 acres	Yet to be determined through the adaptive management process.	Yet to be determined through
California Black Oak	2-18 years Median = 8 <i>a</i>		37 acres		
Canyon Live Oak Forest	7-39 years Median = 13 <i>c</i>		3,517 acres		
Low Meadows-Dry Montane Meadows	1-5 years Median = 2 <i>h</i>		35 acres		
Foothill Pine/Live Oak/Chaparral Woodland	2-49 years Median = 8 <i>b</i>		41 acres		
<b>Foothill Chaparral</b>	30-60 years Median = 30 <i>k</i>	0-30% Jan-Jul 50-70% Aug-Sep 30-50% Oct-Dec	43 acres	Low 0-1% Mod 1-10% High 90-100%	50-6330 (mean = 3,000)
<b>Blue Oak Woodland</b>	2-49 years Median = 8 <i>b</i>	Yet to be determined	311 acres	Yet to be determined	Yet to be determined

1. Based on several sources: a Stephens 1997; b MacClaran and Bartolome 1989; c Taylor and Skinner 1998; d Caprio and Swetman 1993; e Kilgore and Taylor 1979; f Skinner and Chang 1996; g Swetnam et al 1991; h Anderson 1993; i Caprio et al 1997; j Keifer 1991; k U.C. Davis 1996; and l Bahro 1993. 2. Based on GIS analysis. Included only as information on relative fire size by community type since 1930. 3. Based on unpublished A Taylor's work at Lassen Volcanic National Park and need to be refined for Yosemite. 4. Based on BEHAVE outputs.

**a) Implementation**

The boundary between the Fire Use and Suppression FMUs may be modified as a part of the annual FMP review process each spring. Park fire managers will either agree to the fire use FMU boundary as defined in the EIS, or modify it with Superintendent's approval during the annual review process. See the [Implementation Guide 2005](#), as it reinforces the rationale for a more aggressive response to wildland fire, even in those areas where fires are typically managed more for resource benefits... Based upon seasonality and staffing, under certain circumstances, a more aggressive response to wildland fire may occur in the fire use FMU. In order for this action to occur, it must be rationalized and approved by the Park Superintendent.

**b) Historic Role of Fire within the FMUs**

Wilderness ecosystems that have seen less fire exclusion and longer return interval are less at risk for catastrophic wildfire and are therefore, in more of a position to benefit from additional fire on the landscape. Overall, in comparison to the Suppression FMU, FRID values are lower and more of the landscape is being managed for *maintenance* target conditions, rather than *restoration* target conditions.

**c) Response to Wildland Fire within Fire Dependent Ecosystems**

Every effort will be made to allow natural processes, like fire, to prevail in the Fire Use FMU. Initial response to human-caused wildfire will continue to be suppress at the lowest cost with the fewest negative consequences with respect to firefighter and public safety. Public safety objectives may prevail in this case, if a fire was a human caused fire, or due to fire severity, political pressure from local air districts, and/or due to preparedness levels (personnel).

**d) Specific Wildland Fire Management Situations**

**e) Historical Weather Analysis**

Historical weather analysis of the Fire Use FMU uses the Predictive services unit of Yosemite's GACC for a potential assessment every spring.

There are several historical events that factor into the analysis of weather: fire on the landscape late in the season; fire season expanding exposing YNP to an east wind event, the Great Basin High or the Mono winds; early fall high pressure subsidence; and poor overnight single digit RH. East winds coupled with low humidity, with poor overnight humidity recovery have presented historical weather obstacles in the past that impacted operations. If predicted, YNP could take a more aggressive response to wildland fire and potentially acquire more resources.

**f) Yosemite National Park Fire Season**

Every year the fire season seems to be extended. For example, December 5 was our end of season event for 2007, which extended the season and staff. The Yosemite fire season is typically from the beginning of May till Mid October. Climate Change is inevitably causing extended fire seasons, forcing some historic weather data to be irrelevant. In addition, budget constraints are limiting our ability to extend essential staff to cover the broadening shoulder seasons. Prescribed fire operations now begin in early April and continue through November and December.

## **g) Fuel Characteristics**<sup>10</sup>

## **h) Fire Regime**<sup>11</sup>

### **i) Control Problems and Dominant Topographic Features**

Broken, heterogeneous fuels and less mixed conifer/ponderosa pine at the higher elevations give Yosemite fire managers more opportunities to utilize natural barriers like large expanses of exposed granite, steep canyons, and fire scars from past wildland fires. Large swaths of the lodgepole pine fuel type have suffered from mortality by way of the lodgepole pine needle miner. Though significant surface fuel load exists in these stands, once the trees lose their needles, a grass response in the understory tends to inhibit fire spread. Many of these stands are at high elevation (>8000') and have a lot of surrounding granite, as well, further lessening the likelihood of spread. Since the inception of Yosemite's natural fire program in 1972, only 166 of 1,213 recorded fires (14%) have exceeded 10 acres in size. Early snow pack runoff can have the effect of early drying of fuels in the high country, leading to earlier fires in the high country and the potential for larger fires later in the season.

### **j) Other Elements of the Fire Environment Affecting Management**<sup>12</sup>

Pockets of WUI areas, Aspen Valley, White Wolf, Badger, Tuolumne Meadows, Glacier Point, isolated backcountry cabins/patrol cabins, solar toilets, and high sierra camps- are all elements of the Fire Environment that affect management.

## **2. Suppression FMU (17% of the park)**

### ***Wildland/Urban***

In areas close to development in the six WUI communities (i.e., inner WUI areas) mechanical methods are used to remove trees up to 12" dbh to reduce tree density. In some areas, shrubs and ladder fuels will be removed to improve the defensibility of the communities. Passive methods (e.g. hand thinning) will generally be used to thin vegetation up to 12" dbh to reduce hazardous fuels, while aggressive methods (e.g. machine piling) is used to restore forest target conditions in the inner WUI. Aggressive methods could be used to concurrently reduce hazard fuels and restore target conditions in sensitive inner WUI sites to eliminate the need for more than one entry into the site with aggressive tools.

### ***Non-Wildland/Urban Interface, Non-Wilderness***

Beyond the 1½ mile radius around the six WUI areas, wildland fuel and vegetation will only be treated with prescribed fire to achieve target restoration and maintenance conditions. Thinning of live and dead trees will be done to prepare these areas for prescribed burning. After initial fuel reduction work is accomplished, prescribed fire units will be set up for rotational burning to maintain an open forest structure. Passive thinning of small trees less than 20" dbh will occur within 200 feet of the centerline of roads and under utility lines where canopies are closely packed. The occurrence of wildfires in the Suppression FMU may also move ecosystems towards target conditions, however the *Fire Management Plan EIS* requires only public safety and protection objectives for those fires or portions of fires within the Suppression FMU.

### ***Wilderness***

Prescribed fire will be used generally to accomplish ecosystem restoration work in designated Wilderness areas of the Suppression FMU, such as near Wawona. Hand thinning and pile burning will be used where prescribed fire will not be safe. All heavy mechanical equipment will remain outside the Wilderness boundary, and will not 'reach over' from non-Wilderness to Wilderness areas. Equipment used in Wilderness will need to meet the minimum tool requirements for Wilderness. While explicit objectives for resource benefit may not be used on fires or portions of fires in the Suppression FMU, protection of wilderness values is an acceptable objective.

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<sup>10</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; pg III-4 to III-15

<sup>11</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; pg III-4 to III-15

<sup>12</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Alternatives, Section III

**a) Physical and Biotic Characteristics<sup>13</sup>**

**b) Strategic and Measurable Fire Management Objectives**

See FRID and target conditions in the Fire Use FMU section.

**c) Implementation**

Management of fires in the Suppression FMU represent the greatest challenge for fire managers at Yosemite National Park. Given the past history of stand replacing fires in the lower mixed conifer areas in and around Yosemite over the past twenty years, tracking of 1000-hr. Time Lag Fuel Moisture (TLFM) in forest fuel types and live fuel moistures in brush fuels may be the most important considerations, as well as wind speed. Around many of the values at risk, recent mechanical and prescribed fire fuel treatments offer managers anchor points and safety zones, which may be utilized to protect public safety and other values at risk. Seasonality and availability of resources are also criteria that must be considered on any fire start in the Suppression FMU. Smoke impacts to surrounding communities are also a greater limitation in the Suppression FMU, given the closer proximity to visitors and communities. All fires in the Suppression FMU must be closely coordinated with cooperators, especially if there is a risk of the fire moving onto USFS or private lands.

**d) Historic Role of Fire within the FMUs**

Stand replacing fires throughout the park in the 1980s and 1990s- being replaced with brush and shrub. These replacement stands, creating a type change- is a lot more likely to see a high intensity fire before any over story vegetation can return. This area is furthering the perpetuation of a shrub type and no over story. Within the EIS it does not accurately because of this pattern of large, uncharacteristically there is a lot more chaparral region in many places that would historically be a mature pine forest. Historically fires would have burned more frequently- (Taylor recent study- fire return interval pre settlement fires were much smaller and of less severity) The dynamics within this FMU has changed dramatically over the past few decades due to ladder fuels and heavy fuel loads, deep duff, etc.

**e) Response to Wildland Fire within Fire Dependent Ecosystems**

All fires occurring in the Suppression FMU may be considered for a full range of response, from full control through aggressive and costly suppression techniques, to a confine or contain strategy using existing barriers, predicted weather, or minimal suppression activities. Resource benefit objectives may not be applied to fires or portions of fires within the Suppression FMU, though protection of wilderness or cultural values may be used as incident objectives.

**f) Specific Response to Wildland Fire Management Situations**

**(1) Historical Weather Analysis**

There are several historical events that factor into the analysis of weather in Yosemite's Suppression FMU: strong upwind and breezes on southwest facing slopes, all drainages in alpine areas with prevailing winds, and prominent hot, dry seasons.<sup>14</sup>

**(2) Yosemite National Park Fire Season (see Fire Use FMU)**

**(3) Fuel Characteristics<sup>15</sup>**

**(4) Fire Regime<sup>16</sup>**

**(5) Control Problems and Dominant Topographic Features**

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<sup>13</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Affected Environment and Environmental Consequences (Alternative D), Section III and IV

<sup>14</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Affected Environment, Section III-2, III-3

<sup>15</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Ecological Basis for the Alternatives, pg. II-5 to II-8.

<sup>16</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Ecological Basis for the Alternatives, pg. II-5 to II-8.



There are several control problems in the Suppression FMU. For instance, firefighters face steep river canyons with continuous brush fields and flashy fine fuels at lower elevations and in large recently burned areas. Heavy visitor use of the existing road system often slows response time. In the timber fuels, the remaining stands of dense mixed conifer with a high FRID represent the most challenging fires with the potential for stand replacing crown fires and spotting in excess of a mile ahead of the flaming front. Periods of high pressure subsidence over the Great Basin often lead to depressed 1000-hr TLFM, when it is coupled with low overnight humidity recovery and east winds. When the large diameter woody fuels are near the moisture of kiln dried wood in these instances, transition to passive and active crown fire can occur quickly with daytime winds, and active surface fire spread is observed even during the nighttime hours.

#### **(6) Other Elements of the Fire Environment Affecting Management<sup>17</sup>**

WUI Areas, heavy fuel loading areas, and various smoke problems - are all elements of the Fire Environment that affect management of fires foot note within the Suppression FMU.

## **IV. WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS**

### **A. FIREFIGHTER AND PUBLIC SAFETY**

#### **1. Policy**

All actions defined in the Yosemite Fire Management Plan conform to safety policies defined in agency and departmental policy, including, but not limited to:

- Interagency Standards for Fire and Fire Aviation Operations (NFES 2724)
- NPS Director's Order #18
- NPS Reference Manual #18, Standards for Operations and Safety Chap. 3

#### **2. Firefighter and Public Safety**

Firefighter and public safety is the Yosemite Fire Management Program's first priority. This Fire Management Plan and activities defined within reflect this commitment. The commitment to and accountability for safety is a joint responsibility of all firefighters, managers, and administrators. Individuals must be responsible for their own performance and accountability. Every supervisor, employee, and volunteer is responsible for following safe work practices and procedures, as well as identifying and reporting unsafe conditions. All firefighters, fire line supervisors, fire managers, and agency administrators have the responsibility to ensure compliance with established safe firefighting practices.<sup>18</sup>

### **B. AIR QUALITY AND SMOKE MANAGEMENT**

#### **1. Pertinent Air Quality Issues**

Yosemite National Park is classified as a +Class I area under the Federal Clean Air Act (42 USC 7401 et seq.). This most stringent air quality classification is aimed at protecting national parks and Wilderness areas from air quality degradation. The Act gives federal land managers the responsibility for protecting from adverse impacts on air quality and related values, including visibility, plants, animals, soils, water quality, cultural and historic structures and objects, and visitor health.

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<sup>17</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Alternatives, Section III

<sup>18</sup> Reference Manual 18, 2008; Fire Management Plan, Chapter 4, IV

Regulatory authority for enforcement of the Clean Air Act is delegated to the States. In California, the state agency responsible for developing standards is the California Air Resources Board (CARB). CARB has, in turn, delegated enforcement of those standards to the counties. Yosemite National Park lies within three California counties: Tuolumne and Mariposa which are within the Mountain Counties Air Basin, and Madera, which is within the San Joaquin Valley Air Basin- part of the San Joaquin Valley Unified Air Pollution Control District (APCD). Yosemite Valley is in Mariposa County, which is regulated by the Mariposa County APCD, while those areas in Tuolumne County are regulated by the Tuolumne County APCD. Title 17 of the California Code of Regulations (Section 80100) outlines general protocols for coordinating the management of smoke and smoke impacts between agencies that burn and the county APCDs. Specific protocols are implemented and developed on an APCD-specific basis however.

Title 17 expressly states in its introductory general provisions section (80100) that its "(G)uidelines are intended to provide for the continuation of agricultural burning, including prescribed burning, as a resource management tool, and provide increased opportunities for prescribed burning and agricultural burning, while minimizing smoke impacts on the public." It should be noted that in the following Scope and Applicability section (80102), it states explicitly that "no local or regional authority may ban agricultural or prescribed burning."

Title 17 requires burners to get authorization to burn on the day of burn from the local APCD. Currently, this is accomplished via phone, fax, or email with the relevant APCD on an individual basis, with input, coordination, and feedback from a statewide smoke conference call. To augment this system and facilitate better communication and coordination, CARB will soon fully implement the Prescribed Fire Incident Reporting System (PFIRS), an automated, web-based smoke reporting and management system which will allow air regulators and burners to (1) access planned burning activity (2) forecast potential smoke impacts using the latest dispersion modeling, and (3) more efficiently coordinate and schedule prescribed burning. Participation in the streamlined PFIRS system is voluntary, however Yosemite is committed to that participation as soon as it's APCD partners are ready.

Under Tuolumne and Mariposa county smoke management policies, Yosemite National Park is required to submit a smoke management plan (SMP) for each prescribed fire to the APCD for review, approval and issuance of a burn permit. An SMP includes such information as: planned day of ignition, smoke sensitive areas and steps taken to reduce the smoke impacts. Site-specific planning and analysis (including public involvement) is conducted at the project level.

## **2. Smoke Management Program of Work<sup>19</sup>**

From the APCD perspective and in accordance with Title 17, a smoke impact is considered to be any level of smoke that generates complaints, regardless of whether an actual exceedance of National Ambient Air Quality Standards has taken place. Yosemite's fire management program is committed to proactive mitigation of potential smoke impacts as a first resort, with science-based "adaptive" mitigation measures to be used as a last resort only after proactive measures fail to prevent impacts.

Proactive mitigation (i.e., a measure taken before ignition begins) depends primarily on a science-based approach to scheduling burns. This approach takes maximum advantage of favorable dispersion conditions. If smoke impacts are likely (i.e., if a burn is large enough to persist beyond forecasted period), pre-project public notification will be used to make sure that public is informed about duration, potential severity, and methods for reducing smoke exposure. Managing public expectations proactively, not just smoke and it's dispersion, is thus a part of and key to mitigating smoke impacts.

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<sup>19</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Alternatives, Section II-45

Adaptively (i.e., during and after burn projects), our strategy is to measure smoke impacts from burn projects and mitigate those impacts to the extent possible and appropriate, within the parameters set forth in the project's smoke management plan. Critical to this adaptive process is the gathering and analysis of data on current smoke impacts (e.g., portable real-time PM2.5 measurements and webcams), and constant attention to potential changes in the weather forecasts (e.g., spot forecasts and CANSAC wind and dispersion forecasts). Timely dissemination of these analysis results to the Park Superintendent is critical for successful adaptive mitigations.

On the ground, adaptive mitigation actions can include (but are not limited to) hand lines to subdivide burn units in a manner that facilitates better control. Helicopters and other heavy machinery have been brought under only the most extreme cases when unforeseeable weather or other factors have caused dramatic changes in fire behavior and spread potential. For large multi-day burns, we cannot guarantee that fires can be stopped, due to a multitude of factors that the Park Superintendent has to consider before putting firefighters at risk and committing resources holding a fire at given perimeter.

These mitigation measures, both proactive and adaptive, are part of the Federal land manager's toolbox for mitigating smoke impacts, not necessarily eliminating them (although under the right conditions, measurements have shown that impacts can be negligible even close to a fire). Federal "exceptional events" policy both allow for, and indeed are written so that smoke from fires that is part of a "natural" fire regime can still be emitted without necessarily negatively impacting the attainment status (i.e., state compliance under the NAAQS, 40 CFR Parts 50 and 51).

With the exception of the San Joaquin Air Pollution Control district, regional 'Burn Day/No Burn Day' determinations are made by meteorologists at the California Air Resources Board and passed on to the county Air Pollution Control Officers and park fire personnel. Each APCD has a slightly different policy about what those regional burn decisions mean on the ground in their district.

In the past, it has not been uncommon for a burn to be ignited during excellent conditions but persist into periods when atmosphere stabilizes, resulting in greater smoke impacts. In the event of heavy smoke accumulations, the public were notified reactively per the Smoke Communication Strategy<sup>20</sup> and per the Smoke Management Plan specific to the project. Terms, conditions, and mitigation measures, are approved by the air districts and are found within the Burn Permit.

Going forward, we intend to take better advantage of technology tools (i.e., PFIRS and high resolution dispersion forecasts) for submitting project specific smoke management plans, and will leverage the information from such tools to more precisely and proactively plan the ignition of prescribed fires. Ideally, these tools will allow the ignition to occur during periods leading into 'burn days', just before burn days are forecasted, or as allowed by a variance from the county air pollution control officer. Visual impacts and particle (PM2.5) concentrations will be monitored for all prescribed fires. Particle (PM2.5) monitors will be placed at strategic locations and smoke sensitive areas when appropriate. Monitoring data will be available to the county Air Pollution Control Officers upon request, and online an ever-increasing number of air quality monitoring data clearing houses, including:

Terms, conditions, and mitigation measures, are approved by the air districts and are found within the Burn Permit. Ignition of prescribed fires will only be done on 'burn days' or allowed by a variance from the county air pollution control officer  
the "satguard" site (<http://satguard.com/usfs/fleet.aspx?>)  
the AirNowTech site ([www.airnowtech.org](http://www.airnowtech.org)),  
the NPS air resources web page  
(<http://www.nature.nps.gov/air/webcams/parks/yosecam/yosecam.cfm>)

#### **a) Class I Air Quality Areas**

Yosemite National Park is classified as a mandatory Class I area under the Federal Clean Air Act.

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<sup>20</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Appendix, AIV

## **b) Pre-identified Smoke Sensitive Areas**

Smoke movement patterns have a direct relationship to drainage topography, especially below 7,500 feet, because smoke tends to collect and flow downhill at night. Drainages, or “air quality watersheds,” that typically evince this behavior in Yosemite are shown on [Map 2-22](#). Smoke from lower elevation fires (below 7,500 feet) can be intense and under stable, clear skies with long periods of strong radiational cooling tends to move down-slope, settling and concentrating down-valley from a fire.

Elevation relative to the fire is important for understanding potential smoke impacts. Under stable conditions when clouds or smoke prevent strong radiational cooling, smoke tends to “layer out,” staying at or near the elevation that at which it was emitted. To the degree that the smoke “punches through” the surface layer due to strong heating of the air from the fire itself, some smoke can often layer out even on nights when strong radiational cooling is present. Layering out often prevents the full impact of the smoke plume from being experienced by down-canyon communities, if they are several thousand feet below the level of the fire (e.g., El Portal during Yosemite Valley fires). Fires above 7,500 feet rarely cause smoke problems for this reason, and because these elevations have sparser/less consumable fuel types that allow only slow rates of fire spread.

The park would likely control new starts within an airshed that already had a wildland fire being managed within it, if the new starts would result in a violation of PM-2.5 health standards. For example, if a large fire is burning in the Illilouette Creek drainage, it is possible that no other fire would be allowed to burn in that drainage or in the adjacent Merced River, Tenaya Creek, or Yosemite Creek drainages, which all flow into Yosemite Valley. Similar relationships exist for the Bridalveil Creek area, the area around Hetch Hetchy Reservoir, and the South Fork of the Merced River. In addition, experience has taught us that the Buck Meadows, El Portal, Groveland areas, because of the topography of their surrounding drainages, are also highly smoke sensitive areas when fires burn in the airsheds above them. It is also worth noting that during a north wind event fire staff personnel takes precautions with burns in the Merced drainages, due to the movement of smoke toward gateway communities, such as Oakhurst.

## **c) Local and Regional Smoke Management Restrictions and Procedures**

With all actions in Yosemite National Park or the El Portal Administrative Site involving prescribed or response to wildland fires, there will be adherence to local, regional, and national regulations. This process mandates consultation with California Air Resources Board (CARB) and local county Air Pollution Control Officers (APCO), and other federal and state agencies that are involved with similar land treatments.

## **C. GENERAL IMPLEMENTATION PROCEDURES**

Each Fire Management Plan is comprised of the following wildland fire management components that define the wildland fire program. Each of these components is addressed in detail, as they relate to the wildland fire management program (described in Section III). This Operational FMP further refines the most recent direction in the most recent RM-18 (January 2008) by including the material formerly included under the ‘Wildland Fire Use’ program component under the ‘Response to Wildland Fire’ component (formerly ‘Wildland Fire Suppression.’ The ‘Initial Attack’ Section was renamed, as well, to ‘Initial Response.’

Implementation of wildland fire management components are consistent with fire management capabilities and consider the current and predicted conditions affecting fire behavior. Preplanned decisions based on historical fire behavior indices are considered to most efficiently aid in wildland fire response decisions, such as the analysis found in a nationally defined process (e.g. WFDSS). Fire managers use these strategies for expediting the decision-making process when determining whether to respond to a new ignition with public safety or resource management objectives, or a mixture of the two.

## **D. RESPONSE TO WILDLAND FIRE**

### **1. Range of Potential Fire Behavior**

The range of potential wildland fire behavior in Yosemite National Park is from high intensity crown fires to smoldering ground fires.

### **2. Preparedness Actions**

#### **a) Preseason Fire Activities**

The Yosemite Fire Management Program offers several preseason fire activities: local picnics; assessments of coming fire season; presentations to county boards of supervisors, elected officials, upon request to local groups, gateway communities, DNC executives, interagency groups, CalFire (Mariposa Ranger Unit), Mariposa County Fire Department, and adjacent communities. In addition, the fire program presents opportunities for staff to be involved in other fire education activities, see [Section IX](#).

#### **b) Community Education<sup>21</sup>**

Community fire safety education will be provided to communities within and adjacent to the park. This responsibility lies within the Fire Education and Information Program. Yosemite National Park fire managers offer assistance to homeowner groups in Yosemite West, Foresta, Wawona and El Portal, in particular, because of the number of privately-owned homes and property in those communities.

The park provides subject matter experts to advise homeowners about best practices for making their homes & communities fire safe. A sample of groups targeted for community programs include park elementary schools, employee families, park residents, and cooperators. Communities adjacent to the park will be targeted through local elementary schools, county fairs, community meetings, and other organized events. These programs provided to park neighbors will be conducted cooperatively with the U.S. Forest Service, CalFire, the Mariposa County Fire Department, Mariposa Fire Safe Council, and other local organizations.

#### **c) Community Risk Assessment**

Community Wildfire Protection Plans (CWPPs) have been developed for Yosemite West and Foresta. These two documents were produced in a collaborative effort between the local homeowner groups, Yosemite National Park, Wildland Fire Associates of Rangely, Colorado, and other stakeholders. Yosemite National Park fire managers hope to complete CWPPs for all six of the wildland urban interface areas identified in the EIS.

Red Zone, a software package that generates an inventory of individual structure flammability, has been used in both these communities, as well as Wawona. Providing homeowners with the data helps to direct their efforts at improving structure survivability in the event of a wildfire. The Wawona structure assessment was done on paper, rather than a PDA, so digitizing of that data is ongoing.

The Healthy Forests Restoration Act legislation lists three main areas for communities to address in their CWPPs, and structure ignitability is one of them. The other two include (!) ensuring that the document is a collaborative effort, and (2) including a prioritized fuel treatment schedule. Mariposa County is completing a countywide CWPP, and the individual community CWPPs will become appendices to that master document, once they are approved. CWPPs are living documents, maintained by the communities, and are very useful when applying for grant money to conduct fuel treatments.

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<sup>21</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Alternatives, Section II-40

Yosemite West has successfully petitioned the California Fire Safe Councils for a number of grants to conduct fuel treatments and other administrative tasks identified in their CWPP. Foresta has initiated fuel reduction projects identified in their CWPP, including a large mastication project.. Fire managers at Yosemite are trying to be proactive with other collaborative groups, like the Southwest Interface Team (SWIFT) and a the Mariposa and Tuolumne County Firesafe Councils.

**d) Wildland Urban Interface Fire Safety Inspections**

The Fire Prevention Office will conduct wildland urban interface fire safety inspections (often referred to as 'clearance' inspections) on government and privately-owned structures within Yosemite National Park that are deemed a wildland fire risk from or to neighboring park and private lands. The clearance inspections will be based on California Public Resources Code (PRC), Section 4291 and applicable NFPA codes and standards. Where a violation of codes and standards are observed, the Fire Inspector will issue a Fire Inspection Notice to those responsible for the property in violation. This first notice will serve as a written warning to correct violations, detail actions necessary to meet requirements, and indicate when a re-inspection will occur. A re-inspection will be conducted to verify compliance and to determine if further action to gain compliance is necessary.

A reasonable effort will be made to gain compliance codes and standards through educating property owners and occupants in the importance and legal obligation of maintaining property to reduce fire risk. This effort may be through community presentations, posting or distribution of informational messages and publication, and through issuance of Inspection Notices.

**e) Other Community Assistance Activities**

Yosemite fire managers assist with the development and proposal of grants, once a community has a CWPP in place, so they can start applying for grants through the California Firesafe Councils. YNP makes an effort every year to develop a fire severity potential assessment for the upcoming fire season. That assessment is then, in turn, often presented to community groups, along with the film *Best Intentions*, which chronicles a year in the park's fire program, as well as its history and evolution.

**f) Annual Training Activities**

**(1) Annual Safety Refresher**

An annual safety refresher is to be completed by all personnel. Yosemite NP will provide at least 3 refreshers that will last anywhere between 8-16 hours. The scheduled annual safety refresher will be posted on the Yosenet Intranet fire link, on the fire protection calendar, and in the Yosemite National Park daily.

**(2) Qualifications and Needs Assessments**

All firefighters in Yosemite National Park will have their wildland fire qualifications, experience and training maintained in the Incident Command Qualification System (ICQS), including a Individual Development Plan, which will direct training priorities. ICQS will generate a red card annually and is valid after signature by the Chief Fire Management Officer. Forms for annual red card maintenance, position task books, and the National Wildfire Coordinating Group Qualification Guide (PMS 310-1) may all be found [here](#). Upon completion of all requirements for a new qualification, fire management personnel will be evaluated approved through the park's [Fire Qualification and Review Committee \(FQRC\)](#).

**(3) Work Capacity Tests**

Standard Operating Procedure for work capacity tests may be found in the [Work Capacity Test Administrator's Guide](#) (NFES 1109, April 2003).

#### **(4) Readiness Inspections**

Readiness inspections will be completed annually for all organized Yosemite National Park fire resources (e.g. helitack, engines, hand crews). Readiness reviews may be conducted by outside contractors or by in house personnel. Results will be made available to the Park Superintendent. Readiness inspections will be completed for each season, prior to units being made available for off park assignments.

#### **(5) Fire Weather and Fire Danger**

##### **(a) Weather Stations**

Refer to Appendix?? Fire Danger Operating Plan for weather station Information.

##### **(b) NFDRS**

Refer to Appendix ?? Fire Danger Operating Plan for NFDRS information

#### **(6) Specific Staffing and Action Guide**

##### **(a) Introduction**

This plan is the authority for emergency staffing of personnel in positions appearing on the Specific Staffing and Action Guide and other Park or AD personnel as needed to fill these positions. The plan is a guide for administrative decisions. Implementation requires daily consideration of existing conditions and available funds.

YOSE Emergency Communications Center (ECC) will utilize the WIMS program to determine the Actual and Predicted Staffing Levels. The Staffing Levels will have 5 breakpoints on a scale of 1-5. The breakpoints provide the fire manager the ability to make decisions based on the various fire danger rating outputs. Staffing levels derive from fire history, historic fire weather, Burning Index and Energy Release Componetns at the 90% - 97% percentiles for each weather station.

##### **(b) Objectives**

To provide for emergency pre-suppression action in Yosemite in accordance with existing laws, regulations, guidelines, and management directives.

To specify the maximum measures that can be allowed without appealing to higher authority. Judgment and existing local conditions will often require less. The need in all cases will dictate the use to authorize overtime for employees engaged in these activities.

##### **(c) Responsibilities**

**Park Superintendent** – Responsible for approving the plan at the Park level. Will provide for controls during the season to see that it is properly used within P11 and E11 business rules.

**Branch Chief of Fire and Aviation Management:** – Coordinates the overall Park Program and has the responsibility for implementation of this plan. Will provide guidance and clarification of any item in this plan, as required.

**Deputy Chiefs** – Responsible for the proper execution of all fire management activities in their Division and any area under contract from other public agencies. This includes understanding, adhering to, and implementing this staffing plan with judgment as existing conditions warrant. Local written direction should be prepared.



**Communication Center Manager** – Responsible for the summarization and documentation of action taken within the guidelines of this plan. S/he will advise the Branch Chief for Fire and/or Park Fire Duty Officer of any discrepancies noted. ECC will compute and announce the individual weather station (RAWS and Manual) Staffing Levels.

**Work Supervisors** – The responsible official who will direct the program of work as stated in the Specific Action and Staffing Guide and verify that duty has been ordered.

**(d) Management Policies**

The individual weather station (EI Portal and Crane RAWS, highest of the two) Actual Staffing Level calculation will be utilized to determine extended staffing, and the individual weather station Predicted Staffing Level will be utilized, as the basis for the next day's staffing, unless special conditions exist.

Major fire(s) in progress in the park can effect staffing. Annual leave may be cancelled and lieu days may be ordered worked compensated by overtime. This also applies to lightning concentrations with fires in uncontrolled status.

**(e) Fiscal Requirements**

(ref. PMS 902 and RM18 chapter 16)

Fire management personnel will be financed from P11 to the extent budgeted for pre-suppression activities.

**Overtime** - All fire related overtime will be charged to E11 or on base accounts only when pre-approved by the Chief or Deputy Chiefs. To backfill non-P11 funded positions the Park may choose to charge the replacement resources base pay to the emergency account or the base whichever the assigned resource is not charging to. E11 may not be preprogrammed or budgeted in any way.

**Fire Season Employment** - Employment of personnel, as listed in this guide, may begin at the start of a pay period closest to May 15th, or sooner if P11 budget allows, and may continue through October 15, or longer, if fire season persists.

**Administratively Determined personnel hires:** personnel may be used as directed by the AD Pay Plan to meet the requirements of this plan.

**Extended Emergency Staffing** - May be authorized under the following conditions: Staffing Levels as outlined in the Specific Staffing and Action Guide tables.

- Arson
- In-season holidays and 3-day weekends
- Red Flag conditions
- During other times of increased risk when abnormal fire problems are anticipated

The Duty Officer will notify ECC by 1700 of their intent to extend staffing. They will identify which resources are to extend. At 1715, ECC will broadcast to the Park which resources will be extending their hours.

**(f) STAFFING**

**Tour of Duty** - The Fire Management Organization will establish the regular daily tour of duty for each employee in the Park. Core hours for all initial attack resources will be 0930 to 1800 hours, commencing May 15, or sooner, if P11 budget allows.

**Park Duty Officer** – During fire season the park will have a fully qualified Park Fire Management Officer dedicated to the duties of overall supervision of the fire program. This person will be responsible for reporting to the Chief Ranger and briefing the park superintendent on current fire activity in the park. When new large fires are reported on the situation report a briefing to the Deputy Regional Fire Management Officer will also be required. Out of fire season, a Deputy Chief or Battalion Chief may serve in this capacity.

**Fire Duty Officer** - The Park fire resources will be supervised each day of the week by a qualified Duty Officer (Division Supervisor and Type III IC qualified per Regional Policy for a High Complexity Park) and be free of individual module responsibility. This individual will contact the Park Duty Officer or the Fire Branch Chief and inform them of current activity in park as soon as practical. The Fire Duty Officer is also responsible for coordinating the park priorities for fire and search and rescue.

**Days Off** – All personnel will have a minimum of 1 day off per pay period unless one or more of the following conditions exist:

- Uncontrolled fires on or a threat to YOSE.
- Initial attack resources or facilitating personnel are depleted to the point where coverage does not meet the requirements of this plan.
- A module is below required strength.

When any of the above circumstances are applied, causing an employee to exceed 14 days of work, supervisors will ensure that the employee receives 2 days off within a period of 21 days.

**Maximum Daily Tour** – Maximum time to be worked in any single day will be 12 hours, unless emergency work is involved.

#### **Module Staffing**

Engine, Hand Crew, Helitack, Lookout, and other regular crews used for fire suppression shall be trained to standards and accompanied by a red carded qualified supervisor each day the crew is on duty.

Type 3 engine crew is four person effective. A minimum of 3 persons, including a red carded qualified supervisor, is allowed for extended staffing.

Type 6 engine crew is three person effective.

Hand Crew modules will consist of a minimum of 10 and a maximum of 20 persons, including the crew lead.

Type II helicopter modules, will be 5 person effective. A minimum of 5 persons, including a red card qualified supervisor is required for type II helicopters. If a Type III ship is on the unit, a minimum of 3 persons, including a red card qualified supervisor is required.

Module supervisors will be career employees, either PFT or permanent seasonal (WAE). The alternate or assistant supervisor should also be a career employee, whether an operator (driver), assistant, or some other working title. If no red carded qualified supervisor is present, the module is not available for fire dispatch.

**YOSEMITE NATIONAL PARK  
SPECIFIC STAFFING and ACTION GUIDE  
COMMUNICATION, EDUCATION AND PREVENTION**

---

**REGION:** PWRO  
**PARK:** YOSE  
**GACC:** SOUTH OPS  
**FIRE DANGER RATING:** ALL  
**ACTION CODE:** AR – Action Require AA – Action Authorized  
**RESOURCES:** ALL YOSE FIRE/FUELS PERSONNEL  
**NFDRS RATING:** ALL

ACTION DESCRIPTION	STAFFING LEVELS				
	1	2	3	4	5
✓ Regular scheduled tours, assigned prevention work.	AA	AA	AA	AA	<b>AR</b>
✓ Sixth day work week permitted.			AA	AA	AA
✓ Special prevention, regulation and enforcement, where we have legal contract or permit stipulations and in conformance with Regional policy.			AA	<b>AR</b>	<b>AR</b>
✓ Wilderness camping permits				<b>AR</b>	<b>AR</b>
✓ Industrial and construction projects					
✓ Restriction and closure plan					
<b>Holidays, weekends and other periods of high risk.</b>					
✓ Park Fire Management personnel should review prevention effort scheduled for the day and determine best method of contacting users in high hazard areas.			AA	AA	<b>AR</b>
✓ Hire Administratively Determined personnel to assist with prevention, education and information efforts				AA	AA

**NOTES:**

**YOSEMITE NATIONAL PARK  
SPECIFIC STAFFING AND ACTION GUIDE  
DETECTION**

---

**REGION:** PWRO  
**PARK:** YOSE  
**GACC:** SOUTH OPS  
**FIRE DANGER RATING:** ALL  
**ACTION CODE:** AR – Action Require AA – Action Authorized  
**RESOURCES:** CRANE FLAT HELIBASE  
**NFDRS RATING:** ALL

ACTION DESCRIPTION	STAFFING LEVELS				
	1	2	3	4	5
<b>Aerial Detection</b>					
✓ Arson, holidays, weekends, and other periods of high risk.		AA	AA	AA	AA
✓ During and several days after thunderstorms and adverse weather conditions.		AA	AA	AA	<b>AR</b>
<b>Lookouts</b>					
✓ ECC will make daily contact with Pilot Peak and Signal Peak Lookouts.			<b>AR</b>	<b>AR</b>	<b>AR</b>

**NOTES:**

**YOSEMITE NATIONAL PARK  
SPECIFIC STAFFING AND ACTION GUIDE  
INITIAL RESPONSE TO WILDLAND FIRES**

---

**REGION:** PWRO  
**PARK:** YOSE  
**GACC:** SOUTH OPS  
**FIRE DANGER RATING:** ALL  
**ACTION CODE:** AR – Action Required; AA – Action Authorized;  
**RESOURCES:** ALL FIRE PERSONNEL  
**NFDRS RATING:** ALL

ACTION DESCRIPTION	STAFFING LEVELS				
	1	2	3	4	5
<b>Initial attack modules on regular scheduled tours in response areas, during the budgeted fire season.</b>					
✓ Minimum Staffing – meeting module criteria.	AA	AA			
✓ Full Staffing – meeting module criteria.			<b>AR</b>	<b>AR</b>	<b>AR</b>
✓ Initial attack modules prepared to meet get away standards as set forth in the Operational Fire Management Plan, during the budgeted fire season or when severity is authorized.	<b>AR</b>	<b>AR</b>	<b>AR</b>	<b>AR</b>	<b>AR</b>
✓ Sixth or seventh work day.				AA	AA

**NOTES:**

**YOSEMITE NATIONAL PARK  
SPECIFIC STAFFING AND ACTION GUIDE  
FIRE REINFORCEMENTS**

---

**REGION:** PWRO  
**PARK:** YOSE  
**GACC:** SOUTH OPS  
**FIRE DANGER RATING:** ALL  
**ACTION CODE:** AA – Action Authorized; AR – Action Require  
**RESOURCES:** ALL FIRE PERSONNEL  
**NFDRS RATING:** ALL

ACTION DESCRIPTION	STAFFING LEVELS				
	1	2	3	4	5
✓ 6th or 7th day authorized for Crew 6 and/or Crew 7/or Crew 9				AA	AA
✓ Replace/backfill Crew 6, 7, and Crew 9 if committed.				AA	AA
✓ Replace H-551 if committed				AA	AA

**NOTES:**

**YOSEMITE NATIONAL PARK  
SPECIFIC STAFFING AND ACTION GUIDE  
COMMAND STAFF AND SUPPORT**

---

**REGION:** PWRO  
**PARK:** YOSE  
**GACC:** SOUTH OPS  
**FIRE DANGER RATING:** ALL  
**ACTION CODE:** AR – Action Required; AA – Action Authorized;  
**RESOURCES:** COMMAND STAFF AND EMERGENCY COMMUNICATIONS CENTER  
**NFDRS RATING:** ALL

ACTION DESCRIPTION	STAFFING LEVELS				
	1	2	3	4	5
✓ Division Chief/Battalion Chief or qualified Duty Officer on duty				AR	AR
✓ On regular scheduled tours.	AR	AR	AR	AR	AR
✓ 6th or 7th day.				AA	AA
✓ Chief 6th & 7th day of work.				AA	AA
✓ Increase ECC staffing to meet increased/ongoing fire activity				AA	AA
✓ Support Needs. (Order, additional IADP's and/or EDRC etc.)				AA	AA

**NOTES:**

Yosemite Emergency Communications Center: Minimum staffing for fire needs only, non-fire impacts will require additional staffing over and above those shown.

**YOSEMITE NATIONAL PARK  
SPECIFIC STAFFING AND ACTION GUIDE  
HOLIDAY AND EXTENDED STAFFING**

---

**REGION:** PWRO  
**PARK:** YOSE  
**GACC:** SOUTH OPS  
**FIRE DANGER RATING:** ALL  
**ACTION CODE:** AR – Action Required; AA – Action Authorized;  
**RESOURCES:** COMMAND STAFF AND EMERGENCY COMMUNICATIONS CENTER  
**NFDRS RATING:** ALL

ACTION DESCRIPTION	STAFFING LEVELS				
	1	2	3	4	5
<b>FEDERAL HOLIDAYS and HOLIDAY WEEKEND STAFFING</b>					
✓ All FAM personnel authorized to work on a holiday that is a normal scheduled work day.			AA	AA	AA
<b>AUTHORIZED HOURS FOR EXTENDED EVENING STAFFING:</b> Time extensions will be within the following table					
✓ Daylight Savings Time up to 2 hours				AA	AA
✓ Standard Time up to 1 hour				AA	AA

**NOTES:**

Extended hours will not go beyond times shown unless special conditions exist.



### 3. Preparedness Plan

[The Preparedness Plan](#) is a comprehensive set of documents that provide management direction for wildland fire operations, including initial response and incident management activities. These actions are based on the goals, objectives, and wildland fire management strategies identified in the Yosemite Fire Management Plan, as well as established local level procedures for wildland fire operations. Actions for initial response and incident management are based on factors such as the time of year, burning conditions, resource commitment and fire activity. The Preparedness Plan will be reviewed annually and is included in Appendix H.

The NPS requires the following elements in the Preparedness Plan:

- Initial Response, Dispatch, and Notification Plan
- Strategic fire size-up procedures; checklist
- List of park personnel available to assist with wildland and prescribed fires, including fire qualifications (Rothell - Master list to be printed and attached to this plan as an appendix under preparedness)
- Annual Delegation of Authority from the Superintendent to the Chief Fire Management Officer
- Job Hazard Analyses for fire and fire aviation activities [FS Index](#)
- [Agency Administrator's Guide to Critical Incident Management \(NFES 1356\)](#)
- Identified location of current fire cache inventory
- Structure protection inventory and needs
- Identified location of procedures for park evacuation and closure
- Minimum impact tactics guidelines that are used in the park, and where needed, wilderness (minimum tool) considerations

### 4. Initial Response to Wildland Fire

Initial response to wildland fire can include aggressive actions consistent with firefighter and public safety and values to be protected. This strategy is applied as either the only available response, when fire management plans have not been completed, or as a strategy selected through a nationally defined analysis process (e.g. WFDSS)

#### a) Information used to set initial response priorities

Yosemite Fire Management Plan's initial response priorities are identified on run cards in the ECC and vary, depending on dispatch level, elevation, and fuel type; See the Initial Response, Dispatch, and Notification Plan.

#### b) Criteria for the appropriate initial response consistent with GMP/RMP objectives

Protection of public safety, as well as other values at risk is consistent with GMP objectives and is reflected in initial response run cards.

#### c) Confinement as an initial response strategy

A confinement strategy may be implemented as the initial response action as long as it is not used to meet resource management objectives in the Suppression FMU. Confinement may be selected to maximize firefighter safety, minimize costs, and to maximize availability of critical resources during periods of high fire danger or fire activity in highly valued resource areas. Confinement can also be a selection developed through a nationally defined analysis process (e.g. WFDSS), when the fire is expected to exceed available management capability. When confinement is selected as the initial response, a long-term plan is needed to guide the implementation of the confinement strategy. The plan is approved and periodically reviewed and reauthorized by the Superintendent or designee.

#### d) Typical Fire Response Times

Typical fire response times fall under 'Get Away Standards', which are: two minutes during day time and ten minutes at night.

#### **e) Restrictions and Special Concerns by Management Area**

During initial response actions, procedures like the use of bulldozers and aerial application of retardants are restricted and of special concern by management.<sup>22</sup> In addition, there are special concerns regarding the need for air tankers with a fugitive retardant requested.

#### **f) External Issues**

A potential external issue during the initial response to wildland fires in Yosemite National Park is providing initial response resources for other agencies.

### **5. Managing Incidents for Resource Benefit**

Development of resource management objectives to guide wildland fire response is based soundly on management objectives found in the EIS (public and firefighter safety, cultural and natural resource objectives, etc.). Incident objectives then direct fire managers to tactical decisions for each point on the fire. Managers have the full range of fire management strategies available to them on a fire's entire perimeter. A nationally defined analysis process (e.g. WFDSS) will be initiated for all wildland fires occurring in the Fire Use FMU. This process will be identical to the strategic decision making process used on fires in the Suppression Zone, with the caveat that only fires or portions of fires within the Fire Use FMU may be managed for resource benefit objectives.

#### **a) Resource Management Objectives**

[See Wildland Fire Use Implementation Procedures Reference Guide.](#) While many resource management objectives, both broad (e.g. "restore natural processes") and narrow (target conditions for vegetation) may be found in the *Fire Management EIS*.<sup>23</sup> It appears that broader 'boilerplate' objectives found in most incident planning documents (formerly WFIP for wildland fire use and WFSa for suppression) may be preloaded into WFDSS. The most important element in the development of resource management objectives for incident planning comes from the interdisciplinary team assembled for each incident to complete the planning document for approval by routine revalidation by the Park Superintendent. In Yosemite National Park there is a strong Resource Advisor program, and those individuals are usually the first involved in the initial planning process, however other specialists may be called upon, as the incident progresses, to refine or change resource management *or* resource public safety objectives

#### **b) Relative Risk Assessment Process**

[See Wildland Fire Use Implementation Procedures Reference Guide.](#) Though the linked Implementation Guide is under revision, it appears that all fires will now be planned using a nationally defined analysis process (e.g. WFDSS). With Yosemite as a pioneer park in 2009, the park may choose to use the older WFIP and WFSa planning process, depending on the availability of trained staff to utilize WFDSS. For fires or portions of fires being managed for resource benefit, it is clear that the WFDSS process will be similar to the WFIP document development with an Initial Fire Assessment that includes the Strategic Fire Size-Up, Decision Criteria Checklist, Management Actions, and Periodic Fire Assessment. The Stage I analysis documents the current and predicted situation, documents all appropriate administrative information, and aids managers by providing them with decision criteria to make the initial decision whether to manage the fire for resource benefits or to take suppression action. Continued management of larger incidents over a longer period of time will trigger a longer document with additional fire behavior analysis, such as the FSPro module within WFDSS.

#### **c) Pre-Planned Wildland Fire Use Implementation Procedures**

[See Wildland Fire Use Implementation Procedures Reference Guide.](#) Because of the extensive fire use history in Yosemite, preexisting MMAs may be used depending their applicability to events. The current agreement with Stanislaus is to allow fire to cross through the Yosemite Wilderness into the Stanislaus Forest.<sup>24</sup>

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<sup>22</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Restrictions on Suppression, Section IV-5

<sup>23</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Appendix, AIII

<sup>24</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Appendix AIII-13

**d) Non Pre-Planned Wildland Fire Use Implementation Procedures**

For fires that extend beyond a single operational period, some periodic assessment of the planning document approved by the Park Superintendent will have to be reviewed, particularly when there is some change to incident objectives. The planning document generated by WFDSS will specify the frequency or criteria for periodic assessment and recertification by the Park Superintendent.

**e) Mandatory Staff Positions**

[See Wildland Fire Use Implementation Procedures Reference Guide](#). Historically, in Yosemite National Park there has been a need for a qualified Fire Use Manager I or II (FUM1/FUM2), as defined by current NWCG standards, to complete the planning documents and oversee operations on backcountry fires or complexes of fires being managed for resource benefit. While day-to-day operational direction may fall to an ICT3 or ICT4 under the revised fire policy implementation guidelines, there will still be a need for a FUM1 or FUM2 to coordinate ID team meetings, draft resource management objectives and ensure completion of a WFDSS document that captures the intent of park resource and wilderness specialists. Another key position is a fire behavior position. A Fire Behavior Analyst will continue to be important for day-to-day operational shift briefings focusing on firefighter safety. A Long Term Fire Behavior Analyst may also be beneficial for producing calibrated and well-interpreted long-term fire behavior modeling products, like those produced by FSPro, FARSITE, etc.

**f) Provisions for Public Information and Interpretation**

See [Section IX](#) and [Appendix F](#)

**6. Extended Attack and Large Fire Response**

**a) Implementation Plan Requirements**

Daily revalidation of the nationally defined analysis process (e.g. WFDSS) document provides an opportunity to compare expectations with the actual success of the wildland fire response efforts. Based on this comparison, tactics may be changed or a different management alternative selected. The following park staff are involved in developing and reviewing this document:

Chief Fire Management Officer  
Deputy Fire Management Officer, Operations  
Deputy Fire Management Officer, Fire Use  
Prescribed Fire Specialist  
Fire Operations Specialist  
Helicopter Operations Specialist

**b) Complexity Decision Process for Incident Management Transition**

Initial response will normally end after approximately 24 hours after detection of the fire. By this time, the fire should be either declared confined, or be transitioned to extended attack. Transitions to a more complex operation can be a source of safety issues, as tactics become more complex, the type and numbers of modules increases, and new individuals become involved. The Fire Management Officer or designee will confirm that the incident qualifications are appropriate for the escalating complexity of the incident.

The park will normally manage Type V, IV, and III incidents. Type II and Type I incidents will require an Incident Management Team. The local Southern Sierra Nevada IMT will normally be requested initially; if unavailable, another team will be ordered. The checklist to determine the type of team needed is shown in the [Interagency Standards for Fire and Aviation Operations](#) ("Red Book"); Incident Management Considerations are shown in RM18, Chapter 9, page 18.

Upon transitioning to an IMT, the park has several decisions to make, which may be stated in the Delegation of Authority to the IMT. These include:

- Whether the park will continue to be responsible for initial response on new fires, or if it will turn that responsibility over to the IMT;
- If there are multiple fires in the park, which fires will continue to be managed by the park and which will be managed by the IMT;

- Identification of agency representative, resource advisor, and media relations contact;
- Identification of Minimum Impact Management Tactics (MIMT) as the standard policy for fire management activities on NPS lands. MIST techniques and the snag retention policy are listed in Appendix H.

**c) Delegation of Authority for Incident Commander**

An example can be found in [Interagency Standards for Fire and Fire Aviation Operations](#), Appendix H. Include a section on communication responsibilities or agreements between the park and the team, such as the role of the superintendent or media affairs office in speaking about the activity of the fire.

**7. Minimum Impact Management Tactics**

Use of Minimum Impact Management Tactics (MIMT) is the standard policy for fire management activities on NPS lands. See Appendix H.

**8. Short and Long-term Rehabilitation Guidelines and Procedures**

See Appendix N

**9. Completion and Tracking of Records and Reports**

The Yosemite Fire Management Program is in compliance with RM 18 and the National guidelines for completion and tracking of fire recording and reporting. All fires, no matter what combination of management objectives were applied, will have the following items gathered as part of the permanent project record:

- Planning documentation generated through a nationally defined analysis process (e.g. WFDSS).
- Include all amendments and revisions.
- Monitoring reports and summaries of findings, along with a summary of all monitoring activities including a monitoring schedule (level 1 and 2 monitoring).
- Revalidation and certification documents
- Funding codes and cost accounting
- Project maps
- Permanently map and archive all fires greater than 10 acres, using GIS whenever possible.
- Other information as appropriate for the situation, such as photo points
- Explain the funding/fiscal tracking of costs associated with the wildland fire

**E. FUELS MANAGEMENT**

**1. Fuels Planning and Documentation**

Multi-year fuels treatment plans are required elements of National Park Service Fire Management Plans. The Yosemite National Park AFMO (Fuels) is responsible for developing and updating the park's multi-year fuel treatment plan (Appendix I). It is expected that the AFMO will work in close concert with the Prescribed Fire Specialist, Fire Ecologist and Resource Management and Science staff in the development and updating of that document .

The fuels management program will implement fire management policies and help achieve resource management and fire management goals as defined in: (1) Federal Wildland Fire Management Policy and Program Review; (2) Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy (USDOJ/USDA); and (3) A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan.

**a) Participants**

The key members of the interdisciplinary group that will be involved in developing and updating the fuels treatment program:

- Chief Fire Management Officer
- AFMO (Fuels)
- Prescribed Fire Specialist

- Fire Ecologist
- Fire GIS Specialist
- Specialists from the Division of Resource Management & Science

#### **b) Identification of Candidate Projects**

Areas for fuel treatment projects are identified in the 2004 EIS and were developed through an extensive collaborative process that involved considerable public involvement. In that document, Special Management Areas were identified for fuel treatment projects. Special Management Areas occur in both the Fire Use and Suppression FMUs. They include WUI communities and other developed areas, three giant sequoia groves (Mariposa, Tuolumne, and Merced), and the boundaries of Yosemite National Park. These areas require special management because unwanted, high-intensity wildland fire could alter these areas substantially with potentially irretrievable results. There is general agreement that treatments outside of those areas identified in the EIS would require additional NEPA analysis.

#### **c) Project Prioritization Criteria**

From the 2004 EIS candidate projects are prioritized using the following scheme:

**Level 1:** Special Management Areas, including:

- Wildland/urban interface areas
- Giant sequoia groves
- Park boundary areas

**Level 2:** Prescribed fire units adjacent to Special Management Areas, some of which would be managed using maintenance targets because, due to prior burning, they are within target conditions. Prescribed fire units close to Special Management Areas would provide an additional buffer from an approaching wildland fire because fuels would be reduced, thus lowering the risk and intensity of a wildland fire.

**Level 3:** Maintenance burning of prescribed fire units that have been previously treated could have a higher priority than first entry (initial) burns. Keeping previously treated areas in their restored condition would be more important than treating new areas in many cases, and in particular would avoid the repeated buildup of fuels. This is especially true of burned areas that have a FRID value approaching 4.

**Level 4:** Areas requiring the reintroduction of fire to mitigate the potential for high-intensity fire due to four or more missed fire return intervals. These would likely be areas that have no record of being burned since the establishment of the park in 1890

**Level 5:** All other areas.

Another important consideration for treatment prioritization is taking advantage of wildfires that occur on the landscape from year-to-year. Each wildfire creates opportunities for their use as a natural barrier to subsequent, adjacent projects. Building on this self-organizing principle of fire on the landscape reduces the impacts associated with line construction, snag mitigation and holding costs. Adapting to an ever-changing fire altered landscape is accomplished through the annual review and update of the multi-year treatment schedule (see below).

#### **d) Updating the Fuels Treatment Plan<sup>25</sup>**

The multi-year fuels treatment plan (Appendix I) is reviewed annually and can be updated to include new projects and to drop or revise previously proposed projects. The updates are a part of the annual update to the Fire Management Plan and require approval by the Superintendent, assuring that any changes in the treatment plan are within the authority of existing compliance documents.

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<sup>25</sup> Consult with Director's Order 12 and/or the Environmental Compliance Specialist

The NPS Environmental Screening Form is a document which may be used to guide the review of current and proposed projects to ensure that they are within the scope of existing compliance. Projects that fall outside existing compliance may require completion of new compliance processes.

## **2. General Fuels Management Implementation Procedures**

### **a) Annual Preparation and Implementation Activities**

Fuels planning occurs from the official end of fire season and the last prescribed fires in the fall (late October to mid-November) until the first spring burn (April-May). While managers must be mindful of mid-winter burn windows that might be available, this period of time is when the writing, editing and review of prescribed fire plans and smoke management plans takes place, as well as out-year project planning and updates to the multi-year project plan. Burn plans and smoke management plans generally require four to six weeks lead time for approval from the Division of Resources Management & Science (RM&S) and the local APCD, respectively. Coordination between the Fire Ecologist, Fuels AFMO, and Prescribed Fire Specialist must occur during this time, as well, so the fire effects crew can develop their program of work.

In early March of each year, fuels project proposals for the following fiscal year, including cost estimates, must be entered into the National Fire Plan Operations and Reporting System (NFPORS). The Fuels AFMO and Prescribed Fire Specialist are responsible for this task. It is important that the Division of Resources Management & Science have an opportunity to input project proposals, as well, and the Fire Ecologist is the conduit by which those projects are passed on to the Fuels Staff. NFPORS projects are broken into *treatments*, which are based on acres accomplished, and *activities*, which are the associated planning items required to implement individual treatments or may be more programmatic in nature. Resource specialists, like the Fire Ecologist, Fire GIS Specialist, and Air Quality Specialist are encouraged to submit activity proposals in NFPORS to supplement their fire based funded salaries or to fund seasonal positions. Other successful NFPORS activity proposals in the past have been items such as non-native plant survey and removal, inventory of cultural sites, and purchase of sophisticated particulate monitors.

Other important dates include proposal deadlines for the Yosemite Fund and the Joint Fire Science program. Traditionally, the Fire Ecologist develops and solicits proposals for both of these programs. Of course, training, instruction and the routine procedures of vacancy announcements and hiring also occurs during the off-season hiatus when fires are not burning in Yosemite.

### **b) Activities**

Activities proposed in the Fire Management Plan will be planned and implemented in accordance with Reference Manual 18, Fuels Management chapter and the Interagency Standards for Fire and Fire Aviation Operations.

### **c) General Fuels Management Strategy**

Fuels treatments include activities such as prescribed (Rx) fire and mechanical thinning. These activities take place within the Suppression FMU and portions of the Fire Use FMU, which includes the more-developed and higher visitation areas of the park. [Map 2-21](#) shows all the burn units in the park designated in the *Fire Management Plan Final EIS* (2004). A summary of fuel treatments allowed by the preferred alternative in the *Yosemite National Park Fire Management Plan Final EIS* (2004) is as follows:



**Table 3. Fire and Mechanical Treatments Allowed**

Treatment Strategy	Suppression Unit			Fire Use Unit		
	Wildland/Urban Interface	Non-WUI/Non-Wilderness Corridors	Wilderness	Wildland/Urban Interface	Non-WUI/Non-Wilderness Corridors	Wilderness
Aggressive Reduction	X					
Passive Reduction	X	X	X	X	X	X
Managed Wildland Fire					X	X
Prescribed Fire (in prescribed fire units)	X	X	X	X	X	X

WUI = wildland/urban interface

**(1) Wildland/Urban Interface (WUI)**

The wildland/urban interface has been noted as a topic of special concern under the federal fire policy. Communities at risk from wildland fire have been identified by local, state, and federal fire management agencies. Much of the fuel management funding appropriated by Congress is intended to be used to reduce the threat of wildland fire to these communities.

Risk and damage caused by wildland fire are not limited to buildings. Wildland fires can create a significant safety risk to the public not only from the fire itself but also by the panic its occurrence can cause. Public health is impaired by long-lasting and dense amounts of smoke. Natural resources, including wildlife, soil, water quality, and vegetation can be degraded for decades, or require millions of dollars to rehabilitate. Local economies, especially those dependent on tourism, can experience severe financial loss when Response to Wildland Fire causes road and area closures, as well as post fire loss of recreational opportunities.

Most importantly, public and firefighter safety are the first priority in the federal fire policy. The implementation of a fuel management program on a sustained, landscape level has been consistently identified as needed to reduce the intensities of Response to Wildland Fires burning in unnaturally dense fuel, and to decrease as fully as possible the number of firefighters who die every year fighting these fires.

Fire management objectives for the WUI are to restore ecosystem structure and fuel loads to more natural conditions so the potential for intense fire is reduced, to make communities safer to defend from wildland fire, and to facilitate safer evacuations in the event of wildland fire. Site-specific prescribed fire and hazard fuel burn plans would be developed for each WUI area. Hazard fuel and forest restoration treatments would only occur on public lands.

There are six WUI areas in Yosemite: Wawona (WUI Area [Map 2-6](#) ,Burn Units [Map 2-7](#)); El Portal (WUI Area [Map 2-8](#) ,Burn Units [Map 2-9](#)); Yosemite Valley (Area [Map 2-10](#) ,Burn Units [Map 2-11](#)); Hodgdon (WUI Area [Map 2-12](#) ,Burn Units [Map 2-13](#)); Foresta (WUI Area [Map 2-14](#) ,Burn Units [Map 2-15](#)); and Yosemite West (WUI Area [Map 2-16](#) ,Burn Units [Map 2-17](#)) These areas contain homes, businesses, campgrounds, historic structures, and other valued resources that require special management to reduce threats to life and property from unwanted wildland fire. A parkwide map of all six WUI areas, including buffer zones , may be found on [Map 2-18](#).

The six areas within the red line plus the ¼ mile buffer on **Maps 2-6** through **2-18** represent the only areas (approximately 6,425 acres) in which mechanical thinning would be used to achieve forest restoration objectives under the provisions found in the *Fire Management Plan Final EIS*. The red line on the maps represents the core of the WUI community area. The core plus the ¼ mile buffer is the inner WUI area, while from ¼ mile up to 1½ mile is the outer WUI area.

Various distances, such as 300'-400' from a structure, have been cited as the area in which vegetation and fuel management activities can make the greatest difference in the structures wildfire survivability (Summerfelt, 2003). However, in some locations the use of prescribed fire as a restoration tool for thinning would be extremely difficult within ¼ mile of structures, particularly because of the potential for embers to cause spotfires on and near buildings. Safety is the first concern for all fire management activities, and the ¼ mile buffer provides fire crews the necessary margin of safety both for themselves and for the structures they are defending from prescribed and wildland fire.

Restoration of forest structure would typically be limited to the denser end of the range of density/frequency shown in Table 1. Fallen trees, limbs, dense understory thickets, and other fuel conditions that could contribute to intense forest fires or excessive heat or fire spread would be removed to meet target conditions.

## **(2) Inner WUI Management**

The inner WUI zone that immediately surrounds structures and facilities in the six WUI areas would be managed first to reduce hazard fuels using prescribed fire or mechanical means, within six to eight years from approval of the *Fire Management Plan EIS*. Trees thinned in this initial phase would be 12" dbh and less, and would be removed with *passive* or *aggressive* methods (Table 4). Prescribed fire also would be used where safe and practical.

Subsequent to hazard reduction work, mechanical and prescribed fire projects would be done to restore forest structure to within target conditions, within 15 to 20 years from approval of the *Fire Management Plan EIS*. Under the *Final EIS*, no trees larger than 20" dbh would be removed mechanically to meet forest restoration target conditions without additional specific environmental compliance documents prepared for public review.

## **(3) Outer WUI Management**

From the edge of the ¼ mile wide inner WUI zone to the limit of the outer WUI zone, at no more than 1½ miles from the WUI community, prescribed fire would be used initially for the achievement of both restoration and fuel reduction targets.

If prescribed fire does not achieve restoration target conditions in this outer WUI zone, mechanical thinning of trees up to 20" dbh, or larger, could be done to achieve these targets, but only following preparation and public review of separate environmental compliance documents. Prescribed fire would be used subsequently to maintain target conditions. Beyond the six WUI areas, prescribed fire, and where feasible, wildland fire, would be used for forest restoration and maintenance activities. Smaller developments, such as backcountry cabins, would be protected from wildland fire by hand thinning wildland fuels near them. Mechanical work, such as handline construction, would be done to prepare an area for a prescribed fire and to protect the area from an approaching wildland fire. It would also be used within 200' of road centerlines and under utility lines to reduce hazardous wildland fuel loads.

## **(4) Giant Sequoia Groves**

Yosemite National Park contains the Mariposa, the Merced, and the Tuolumne groves of giant Sequoias. The natural regeneration of the giant Sequoia is strongly dependent on conditions produced by recurring, moderately intense fires (Harvey et al. 1977). These fires produce optimum conditions for giant Sequoia reproduction by: 1) removing thick layers of dead and downed debris; 2) leaving behind mineral soil covered by a thin layer of ash; 3) maintaining an open canopy; and 4) heating the canopy of mature Sequoias, causing them to release large numbers of seeds.



The primary management objective for each grove would be to preserve, maintain, and propagate giant Sequoias. Other localized objectives within the groves would be to maintain selected areas for aesthetic beauty and scenic vistas, to restore cultural landscapes, and to preserve historic resources such as the Merced Grove cabin. Park vegetation specialists would review plans for actions proposed that might affect the giant Sequoia groves. Mechanical thinning of trees smaller than 12" dbh with passive means may be used, especially to reduce the potential effects of unnaturally intense fire which can scorch and injure giant Sequoias.

#### **(5) Boundary Areas**

Boundary areas are a priority for fuels management because of the risk of unwanted wildland fires that could burn into or out of the park. For example, part of the western boundary of the park from Chiquito Pass in the south to Kibbie Pass in the northwest is particularly flammable and at high risk of wildland fire due to current high fuel loading. Other boundary areas have a low risk of unwanted wildland fire.

The fire management objectives for boundary areas are to re-establish natural fuel loads and vegetation conditions to meet target ecological conditions. Fire management projects within boundary areas would require review by all agencies that share jurisdiction. Agreements may be developed with neighboring agencies to allow fires to burn across jurisdictional boundaries, if safe and appropriate. If an agreement with a neighboring agency were not in place, the Yosemite fire management staff would keep wildland fires within park boundaries.

#### **(6) Fuel Reduction along Roads**

Roads and trails enable fire personnel to get to a fire rapidly. Roads, trails, and utility corridors within the park provide access for monitoring and control of wildland fires. Roads and trails are used as boundaries for prescribed burns, anchor points for constructing fire line, and as fire line. To be useful, maintenance would be done to keep the main road corridors open and in a condition that provides for firefighter safety as a defensible fire line.

Maintenance would be done to keep road (but not trail) corridors free from fuel accumulation. Removing brush and downed trees also would reduce the risk of a fire crossing a road and threatening another area or becoming established below firefighters. The work would thin trees and shrubs less than 20" dbh up to 200' from the centerline of roads in the Suppression FMU. *Aggressive* methods for roadside thinning will not be used in Wilderness.

Roads treated ([Map 2-24](#)) would include the El Portal Road (Highway 140), Big Oak Flat Road (Highway 120), and Wawona Road (Highway 41) in the Suppression FMU; Glacier Point, Hetch Hetchy, Mariposa Grove, and Aspen Valley roads; public roads in five WUI communities (Yosemite Valley is excluded); and fire motorways shown on [Map 2-23](#). **Table II-11** displays roads and trails that are commonly used as fire access for summer wildland fires and as control lines for prescribed fires. Since many of the roads and trails are important cultural resources, maintenance activities would be designed with guidance from Resource Management and Resource Protection to preserve important historic characteristics and to avoid impacts to contributing features. Work along utility corridors also would be conducted to avoid impacts to cultural resources.

Maintenance would be done as needed, annually on some fire roads and every five to eight years on other roads. Most park trails are periodically maintained by Trail Crews to permit stock traffic and hiking access, and some of them are used as fire breaks when the need arises.

### 3. Equipment and Seasonal Use Restrictions

Generally, the thinning of small trees less than 6" dbh may be done throughout the park to protect an area as a wildland fire approaches or to prepare a prescribed fire unit for burning. Hand thinning of these small diameter trees and pile burning may also occur in preparation for or as a surrogate for prescribed burning. Trees, including dead trees, and dense understory vegetation would be cut as needed to provide safe and secure firelines on all types of wildland fire. More extensive mechanical fuel reduction techniques may only be conducted in designated wildland urban interface areas and along road corridors. Those restrictions will be detailed in the Non-Fire Fuel Treatments Section 4(a). Trails and roads closed to vehicular traffic because of Wilderness designations will not be driven on unless approved by the Superintendent. No new roads would be created anywhere in the park for thinning operations.

Until a comprehensive management plan is completed for the Tuolumne Wild and Scenic River, only treatments allowable in the 1990 *Fire Management Plan* (hand cutting trees less than 6" dbh, chipping, prescribed burning) will be used in the Tuolumne River watershed ([Map 5-1](#)). Most of the plant communities within the Tuolumne River watershed are characterized by long fire return intervals and are within the natural range of variability for plant community structure and fire. Therefore, most of this drainage is in the Fire Use Unit.

### 4. Personnel

NWCG guidelines for position qualifications will be adhered to on all prescribed fires. Those prescribed fires rating out as Type I burns using the interagency prescribed fire complexity analysis will require a Type I Burn Boss to be on site in charge of incident operations.

## F. PRESCRIBED FIRE

### 1. Weather, Fire Behavior, and Fire Effects

Prescribed fire monitoring occurs during each burn and is supported by pre- and post- burn fire effects monitoring conducted by the fire effects crew. Monitoring is conducted in accordance with the *NPS Fire Monitoring Handbook*. The Monitoring Plan for Yosemite National Park, which spells out the protocols for fixed monitoring plots is still under development. When completed, this document will support measurement of those variables listed as target conditions for the various ecosystem types found in Yosemite.

### 2. Format for Reviews

The Yosemite National Park Chief Fire Management Officer or Park Superintendent may request a formal review of any prescribed fire. The format of that review may vary, as needed, from informal to a formal review including oversight and participation by the Pacific West Regional Fire Staff.

### 3. Reporting and Documentation for Escaped Fires

- Fire Management will maintain a fire file with dispatch log, resource orders, spot weather forecasts, OF-288 and Crew Time Reports, burn unit plan, notification form, Incident Action Plans, Unit Logs, etc.
- The Burn Boss will maintain ICS-214 Unit Logs.
- The Burn Boss will report to the park archeologist the discovery of cultural resources to be documented in the annual fire archeology report.
- The Burn Boss will prepare an Individual Fire Report, DI-1202, within 10 days after declaring the fire out and will submit it to Fire Management. Attachments to the 1202 will include a fire progression map, smoke management documentation, fire behavior observations, and a complete, accurate final fire map.
- The Burn Boss will prepare a Prescribed Burn Project Accomplishment Report and submit a copy to the Fire Management Officer at the end of fire season.
- The Prescribed Fire Manager/Fire Management Officer will prepare a project accomplishment report in the National Fire Plan Operations and Reporting System (NFPORS).

In the event of an escaped prescribed fire, the Chief Fire Management Officer and Park Superintendent must be notified immediately.

#### 4. Historic Fuel Treatment

A detailed fire history including prescribed fire occurrence may be found on the Yosemite National Park server at W:\GISData\fire\history. Some history of mechanical fuel treatments may also be found there, however the data capture has not been as thorough as for prescribed fire treatments.

#### 5. Local Prescribed Burn Plan Requirements

Burn Plans implemented at Yosemite National Park will contain all the elements found in the [Interagency Prescribed Fire Policy Planning and Implementation Guide](#). A description of the required prescribed burn plan elements can be found in the Interagency Prescribed Fire Implementation Procedures Reference Guide and RM 18, Fuels Management, Chapter 7. Planning for Rx fire events is in the form of a Burn Plan, executed for one or more burn units. The planning process requires adequate time for review and implementation of avoidance or mitigation measures by cultural and natural resource managers. Draft burn plans are submitted to the Resources Management and Science Division Chief for approval signature, affording the division the opportunity to comment on these plans. Prescribed fire projects typically take place in pre-defined units in which cultural resource inventory is more likely to have been completed. Prescribed burning and mechanical thinning are considered undertakings as defined by the Section 106 process and thus subject to its stipulations.<sup>26</sup>

#### 6. Planning and Implementation

The prescribed fire planning and implementation is in accordance with RM 18, Fuels Management chapter and Interagency Standards for Fire and Fire Aviation Operations, and the Interagency Prescribed Fire Implementation Procedures Reference Guide.

### G. NON-FIRE FUEL TREATMENTS

Mechanical fuel treatments within Yosemite National Park are generally confined to the six wildland urban interface zones identified in the *Fire Management Plan Final EIS* (March 2004), roadsides or around the scattered backcountry areas of development (White Wolf, Aspen Valley, Badger Pass Ski Area, Tuolumne Meadows, etc.)

#### 1. Equipment and Seasonal Use Restrictions

**Within the six identified wildland urban interface areas**, *aggressive* and *passive* techniques (see Table 4 below) would be used to remove hazardous fuels and restore target forest conditions. In areas close to development in the six WUI communities (i.e., inner WUI areas) mechanical methods would be used to remove trees up to 12" dbh to reduce tree density. In some areas, shrubs and ladder fuels would be removed to improve the defensibility of the communities. *Passive* methods would generally be used to thin vegetation up to 12" dbh to reduce hazardous fuels, while *aggressive* methods would generally be used to restore forest target conditions in the inner WUI. *Aggressive* methods could be used to concurrently reduce hazard fuels and restore target conditions in sensitive inner WUI sites to eliminate the need for more than one entry into the site with aggressive tools.

*Aggressive* mechanical methods would generally be used only once per site to restore forest target conditions, to minimize impacts. After the use of *aggressive* methods, *passive* mechanical methods and prescribed fire would be used to maintain target conditions.

Woody material, such as logs generated during implementation of mechanical methods, would be used within the park to the fullest extent possible. Otherwise, logs would be removed following methods used by the Hazard Tree Program for many years, but only as a last resort if material could not be burned, chipped, or used inside the park, and did not pose a fire hazard if left on site.

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<sup>26</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Alternatives, Section II

*Passive* reduction techniques would be used in highly sensitive locations of the WUI (i.e., cultural sites, important wildlife habitat, or areas with highly erosive soils). These areas would be identified during the preparation of the operational plan; the plan would be given interdisciplinary review by park archaeologists, biologists, and other specialists.

Beyond the 1½ mile radius around the six WUI areas, wildland fuel and vegetation would only be treated with prescribed and wildland fire to achieve target restoration and maintenance conditions. Thinning of live and dead trees would be done to prepare these areas for prescribed burning. After initial fuel reduction work was accomplished, prescribed fire units would be set up for rotational burning to maintain an open forest structure. *Passive* thinning of small trees less than 20" dbh would occur within 200' of the centerline of roads and under utility lines where canopies are closely packed.

***Within designated wilderness*** prescribed fire would be used generally to accomplish ecosystem restoration work. All heavy mechanical equipment would remain outside the Wilderness boundary, and would not "reach over" from non-Wilderness to Wilderness areas. Equipment used in the Wilderness would need to meet the minimum tool requirements for Wilderness.

**Table 4. Fuel Reduction Techniques for Tree and Shrub Cutting and Removal (live and dead)**

<b>Technique Used for Hazard Fuel Reduction</b>	<b>Description</b>
<b>Aggressive Reduction Techniques</b>	
<b>Mechanized Tree and Shrub Removal (feller-bunchers and forwarding)</b>	Tracked equipment with cutting head severs stem and mechanically lays tree down; stem is stacked whole or mechanically de-limbed and cut-to-length, then decked (stacked) for transport by self-loading rubber-tired forwarder. Used for removal of live trees.
<b>Conventional Tree and Shrub Removal (saws, skidders, and grapples)</b>	Hand crews walk to each tree and fell tree and limb with a chainsaw; tracked or rubber-tired tractors grapple or winch trees or logs and drag them to landings where they are loaded onto trucks to pile for burning. Used for removal of live and dead trees and shrubs.
<b>Machine Crushing/Shredding</b>	Tracked equipment travels to each tree or stump (or within reach of stump—max. 30 feet for "Brontosaurus" shredder head on excavator arm); vegetation is crushed under tracks or shredded by flail cutters, and left onsite. Various equipment types can be used. Used for removal of live trees and shrubs and dead and down material.
<b>Machine Piling</b>	Tracked or rubber-tired tractor grapples or pushes vegetation with front blades and piles it. or tracked excavator with bucket and thumb grapples and piles vegetation. Used following tree removal techniques or for preparing dead and down material for burning or chipping.
<b>Passive Reduction Techniques</b>	
<b>Yarding (various methods)</b>	Cables are suspended from landings and trees or logs are attached to the cables and lifted or dragged to natural openings or landing areas. May involve use of fetching arches, which would reduce surface disturbance. Used to remove freshly cut or dead and down material from burn units.
<b>Hand Cutting/Piling</b>	Hand crews drive or walk to fuel reduction areas and cut with a chainsaws; hand crews pile in place or carry, roll, or drag vegetation to burn sites. Cultural resource technicians clear burn pile. locations.
<b>Cutting/Chipping</b>	Vegetation is transported to the chipper or the chipper is towed through the treatment units or located at approved staging areas. Chips may be broadcast 1" deep, trucked to other areas for use in the park, sold, or given away for cost.
<b>Low-Impact Skidding</b>	Trees are cut by conventional methods and the stem is skidded using horses or ATVs. May involve use of fetching arches, which would reduce surface disturbance. This technique is size limiting in that large trees both live and dead exceed the capability of the technique. Use would limit the ability to achieve restoration in some areas where larger trees need removal.
<b>Girdling (promote tree mortality over a period of time)</b>	Hand crews walk to each tree and cut a four-inch ring into the xylem, or trees are wrapped with fireline explosives and "shot"; ponderosa pines may be baited with pheromone lures to produce bug-kill.
<b>Limb Removal (trees standing after project is done)</b>	Lower (up to 6-10 feet) limbs (living or dead) are cut to remove ground and ladder fuels.
<b>Wildland Fuel Disposal Options</b>	
<b>Pile Burning (machine or hand piles)</b>	Piles are allowed to cure, covered with water repellent material, and ignited when fuel and weather conditions are right. Used to remove surface and ladder fuel component which reduces risk for broadcast burning at a latter date.
<b>Pile and Leave (area would be broadcast burned within five years)</b>	Piles remain on site longer but are removed over time. Wildlife considerations taken into account when leaving piles for longer duration.
<b>Lop and Scatter</b>	Vegetation is dispersed onsite and cut to maximize soil contact. Depth of material does not exceed 24 inches. Eventually consumed during broadcast burning. Drawback is that many saw scars may be visible until area is burned.
<b>Chip and Broadcast (broadcast burn after fuel reduction)</b>	Vegetation is chipped at landings or throughout treatment unit; chip depth, fuel moisture, and ignition pattern are considered in burn prescription development to mitigate smoke production and fire effects concerns.
<b>Chip and Broadcast (leave one inch depth)</b>	Chips are dispersed directly from chipper chute to avoid chip accumulations >1 inch, or chip piles are distributed by hand crews or machines to depth not to exceed 1 inch.
<b>Chip and Haul (give for cost)</b>	Chips are generated into a commercial chip van, or chips are piled and loaded into trucks for use as fiber or fuel. Chips can be donated for outside needs or hauled to sites in park but may also be sold or given away for cost.

## 2. Effects Monitoring Required

Short term and long term monitoring will focus on the degree to which the Restoration and Maintenance *target conditions* (Tables 1 & 2) are being met. The fire effects crew will monitor for those measurable objectives, and that process will be spelled out more carefully in the Monitoring Plan, an appendix to this document, which is still under development.

## 3. Planning and Implementation

The planning and implementation of the non-fire fuels management projects is in accordance with Reference Manual 18, Fuels Management chapter.

## 4. Emergency Rehabilitation and Restoration Reference

For post-fire emergency rehabilitation (stabilization) and restoration planning and implementation guidelines, refer to the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook. Emergency stabilization and rehabilitation actions will be in accordance with Reference Manual 18, Burned Area Emergency Response (BEAR) chapter. It is important to note that, since wildland fire use is no longer a separate fire type, all wildfires are now eligible to receive BEAR funding. In the past BEAR funding was not authorized for those fire exclusively managed for resource benefit.

# V. ORGANIZATIONAL AND BUDGETARY PARAMETERS

## A. SUPERINTENDENT RESPONSIBILITY

The Superintendent of Yosemite National Park has ultimate responsibility and accountability for all fire and fuels management activities. The Superintendent approves, with his or her signature, prescribed fire plans, wildfire planning documents, such as those developed through a nationally defined analysis process (e.g. WFDSS), as well as periodical assessments that certify the continued management strategy of a given wildfire or complex of wildfires. The Superintendent, under certain conditions, may delegate this responsibility to another organizational level. The park Superintendent will meet the performance requirements stated in *the Interagency Standards for Fire and Fire Aviation Operations*.

## B. ORGANIZATIONAL STRUCTURE OF THE FIRE MANAGEMENT PROGRAM

Yosemite National Park contains one of the largest fire management organizations in the National Park Service. The majority of the fire management staff is within the Branch of Fire and Aviation Management of the Protection Division. The Branch is charged with wildland fire management, prescribed fire and fuels management, wildland fire prevention, aviation management, fire education and information, fire ecology and monitoring as well as structural fire prevention and management. Staffing is supported by a combination of wildland fire base funding and ONPS funds. Organization structure of the Branch is shown in **Figure V-1**<sup>27</sup>, displaying each member's role and responsibility. The fire management program in Yosemite National Park is directed by the Chief Fire Management Officer (CFMO). The CFMO works for the Chief Ranger, Division Chief of Visitor and Resource Protection, and supervises six program managers.

The Chief Fire Management Officer supervises the Deputy Fire Chief of Operations, Deputy Fire Management Officer of Prescribed Fire and Fuels, Fire Ecologist, Fire Marshal, Helicopter Operations Specialist and the Fire Education and Information program manager. These Deputy Fire Chief and the Deputy Fire Management Officer each supervises one Battalion Chief. The Battalions are designated as a Fire Operations Specialist and a Prescribed Fire Specialist respectively. The Yosemite National Park Chief Fire Management Officer has no other zone FMO duties in nearby NPS units, given the inherent complexity of the Yosemite program, alone.

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<sup>27</sup> Yosemite Fire Management Plan, 2004; Figure V-1

The Fire Operations Specialist works for the Deputy Fire Chief of Operations and supervises four station captains in El Portal, Yosemite Valley, Wawona and Hodgdon. Three of the four stations have 3 permanent employees who are trained and qualified in both wildland and structure fire. El Portal and Hodgdon are interagency stations with the U.S. Forest Service.

The Prescribed Fire Specialist works for the Deputy Fire Management Officer and supervises the Crew 6 Fire Use Module and the 20 person Prescribed Fire Fuels Module. The Prescribed Fire Specialist is responsible for planning and implementing prescribed fires, managed wildland fire activities and mechanical fuel management projects. This program has seven permanent employees and up to 20 seasonal employees.

The Fire Ecologist supervises one permanent crew leader and a monitoring/fire effects crew of 6 seasonal employees. The fire ecology and effects branch is the primary liaison between the fire management program and the Division of Resources Management and Science.

The Helicopter Operations Specialist supervises a crew of seven, three of whom are permanent employees. Most summers the Crane Flat Helibase will also host up to 4 apprentice firefighters from the Forest Service. Yosemite has an exclusive use Type 2 helicopter contract that operates from May through October. This helicopter program performs all hazards support to all the Divisions in the park. In a typical year, the helicopter will log over 350 flight hours during the contract period. The Yosemite base is the only base in the nation that has a certified a short haul and rappel program. The helicopter and crew will also support adjacent cooperators during initial attack and occasionally large incidents off park.

The Fire Education and Information Manager is in charge of all education and information related to the Branch of Fire Management. This program has expanded to include fire education programs focused on students in the local school districts, elected officials and gateway partners. The Yosemite Education program is a highly successful program that anticipates the public's need for information. The program uses a wide variety of outlets for disseminating information on all aspects of the fire management program.

The Fire Marshal manages all of the code enforcement and compliance requirements for the entire park and the wildland and structure fire prevention program. Yosemite has over 2200 building and a large resident population where life safety is a significant issue due to old historic residential buildings. This program is expected to gain one additional fire inspector position in the near future.

Base funding from fire management funds also funds a GIS specialist, fire archaeologist, and air quality specialist that work within the Division of Resource Management and Science.

### **C. FIRE PROGRAM ANALYSIS (FPA) FIRE PLANNING UNIT (FPU)**

Fire and Aviation Management activities are funded by fire management funds from the National Office and park ONPS sources. ONPS funds the Fire Operations Specialist, Fire Inspector, and Chief Fire Management Officer and additional pay periods for the station captains. The park receives funding for both prescribed fire and mechanical fuel reduction projects, with about one-half of the funds used for fuel reduction contracts.

The budget process for wildland fire funds is handled in a similar process for all national parks. Fire management funding for the NPS is derived from three sources:

Fire Management funds are allocated by the Fire Management Program Center in Boise, Idaho, and managed through annual operating program accounts or through project work accounts, depending on the activity. Activities covered include preparedness activities, permanent staffing, training, monitoring, and equipment purchases. This funding program is intended to identify the minimum acceptable standards that each park fire management program should achieve. The Fire Program Analysis will be used as a vehicle for seeking adequate funding to implement these standards.

Operation of the National Park Service (ONPS) funds are used to support programs that were in place before FIREPRO and to provide enhanced fire management capabilities in many parks. In the event that adequate FIREPRO funds were not appropriated, parks need to supplement FIREPRO funding with ONPS funding to achieve minimum fire management capability. Parks might also use ONPS funds to augment the basic FIREPRO-funded preparedness operation to achieve a higher level of response capability or to retain a stronger initial attack capability outside the defined fire season.

Wildland Fire Operations funds within the NPS portion of the Department of Interior firefighting account could be insufficient to cover expenditures for suppression, severity, rehabilitation, and hazard fuels management during severe fire years. For these situations, the NPS would first request that the department transfer wildland fire management funds from other bureaus or, if these funds were exhausted, use the emergency authority under Section 102 of the general provisions of the Interior Appropriations Act to transfer funds from other programs. The National Park Service would then seek to restore funds to affected programs through a supplemental appropriation.

The Fire Program Analysis (FPA) budgeting process is a new interagency budget process being developed with the intent of going on-line and supplanting all other federal wildland fire management budget process in 2009 for the 2011 budget. FPA will replace the FIREPRO budgeting process for NPS wildland fire management. The fire analysis system will be used to support fire planning, inform budget development and implementation, and identify cost effective fire programs. FPA will be used on an interagency, landscape-scale area called a Fire Planning Unit (FPU). Yosemite National Park is a member of California Fire Planning Unit 7 (CA\_CA\_007), cooperating with the Sierra and Stanislaus National Forests, the Bureau of Land Management, and the Fish and Wildlife Service.

#### **D. INTERAGENCY COORDINATION**

The Yosemite fire management program works closely with various county, state, and federal fire and air quality management agencies. Appendix E displays four agreements with local cooperators.

#### **E. KEY INTERAGENCY CONTACTS BY FUNCTION**

Yosemite Emergency Communications Center updates and maintains an updated list of all fire personnel. This list is included as part of the preparedness plan

#### **F. FIRE-RELATED AGREEMENTS**

All referenced agreements, including equipment rental agreements and contract suppression and prescribed fire resources can be found in Appendix E and on the Yosemite intranet fire management website

## **VI. MONITORING AND EVALUATION<sup>28</sup>**

The Yosemite Fire Management program is driven and supported by scientific information in order to facilitate an adaptive management cycle, resulting in the implementation of safe and effective fire management strategies. Adaptive management processes incorporate monitoring and evaluation data as another link in modifying and supporting management goals, objectives, strategies, and activities.

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<sup>28</sup> Reference Manual 18, 2007; Fire Ecology and Monitoring, Chapter 11



## A. DATA SUMMARY

1. Existing Monitoring Data
2. Ongoing Monitoring Data
3. Management of Data
4. Data Collection and Management Procedures
5. Integrating Data into Annual Reviews and Updates
6. Monitoring Plan<sup>29</sup>

Monitoring of wildland and prescribed fires involves systematic collection and recording of data on fuels, topography, weather, air quality, and fire behavior. Monitoring generally follows the protocols outlined in the [National Park Service Fire Monitoring Handbook \(NPS 1992a\)](#). A fire monitoring plan is a required element in NPS fire management plans. The *Yosemite Wildland and Prescribed Fire Monitoring Plan* provides detailed descriptions and additional protocols for wildland and prescribed fires. This monitoring would be completed by the fuels and ecology group within the Branch of Fire and Aviation at Yosemite National Park and placed in the approved Yosemite Fire Management Plan; assistance would be provided by other park staff as needed.

Monitoring is essential to the successful understanding of wildfires and prescribed fires. Development, evaluation, and refinement of restoration and maintenance target conditions for key vegetation types assist in the establishment of priorities for carrying out prescribed fires (**Tables 1 & 2**). Measurement and analysis of plots, photo points, and vegetation transects would be used to indicate attainment or non-attainment of short- and long-term objectives. Monitoring data is archived and reviewed for future refinement of target conditions and burn prescriptions and to determine program success and effectiveness.

Short- and long-term vegetation monitoring objectives applicable to a specific burn area are stated in the prescribed fire plan. At a minimum, monitoring complies with the protocol identified in the National Park Service Fire Monitoring Handbook. Data collected from short-term monitoring is attached to the fire report along with any narrative completed by the prescribed fire monitors.

### 7. Cultural Resources Monitoring

The NPS recognizes that the effects of fire and the thresholds for unacceptable damage to some types of cultural resources (i.e., archaeological resources) are not well understood. An ongoing effort to obtain baseline information and develop this understanding will make it possible to refine risk management for fire planning. Monitoring the effects of fire in field situations would be an important component of this work. However, until systematic laboratory experiments can be conducted, field-based fire effects monitoring would be limited to empirical observations.

For resources such as cultural landscapes and historic districts, systematic fire effects research and monitoring would focus on indicators or criteria for landscape restoration and maintenance. All cultural resources fire effects monitoring efforts would be coordinated with those of the natural resource fire monitors to collaborate on methodology, ensure consistency in data collection, and take advantage of multidisciplinary applications of data.

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<sup>29</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Alternatives, Section II-48

Outlined below is the minimum level of effort for monitoring the effects of fire on cultural resources. This monitoring would provide feedback on the effectiveness of current resource protection measures, such as site avoidance and pre-burn fuel load reduction. This monitoring would be designed to document pre- and post-burn resource conditions that are readily observable, such as preservation of flammable historic fabric, preservation of milling slicks on archaeological sites, visually identifiable changes in surface artifacts and surface conditions, and changes in landscape conditions in historic districts and cultural landscapes.

As systematic processes for evaluating fire effects evolve, monitoring is revised to support field evaluation. In the interim, cultural resource specialists (usually archeologists) identify any necessary pre-burn mitigation, resource protection measures, and the most appropriate monitoring strategy for planned and unplanned burns. In general, these consist of the following:

**a) Pre-burn**

Prior to a prescribed burn, known cultural resources would be located and current conditions would be assessed, using standard operating procedures. This would include documentation of current fuel loads, likely duration and intensity of a fire, threats to features and artifacts, and potential for subsurface impacts through burning roots and stumps. These data would be assessed to determine: (1) which protection measures should be implemented (if any); (2) the potential for fire effects studies; and (3) additional monitoring needs. All three measures would be used on prescribed burns, while monitoring of wildfires would typically begin after a fire started. Results of monitoring would enhance the understanding of the effects of fire and fire management activities on cultural resources. Burn prescriptions and techniques used to protect resources also would be refined accordingly.

**b) During Burn**

Criteria for monitoring and protecting sites during burns are outlined in the standard operating procedures. For selected fires, an archeologist would be assigned as Cultural Resource Advisor or as a technical specialist providing recommendations to an interdisciplinary Resource Advisor. Although this would be primarily for resource protection, it also would provide documentation of fire behavior and immediately observable effects of fire in and adjacent to cultural resources. If suppression or holding actions were to be taken, the Cultural Resource Advisor would monitor as needed and advise on site-specific actions.

**c) Post-burn**

An archeologist would revisit known cultural resources in burn areas to document any changes in condition and to assess post-burn protection needs. Fire effects to cultural resources would be documented and subsequently added to the database on cultural resource fire effects.

## **VII. FIRE RESEARCH<sup>30</sup>**

Research considerations are important to NPS fire management implementation. Adaptive management processes incorporate research findings as another link in modifying treatment objectives, and refining land management objectives and goals.

The current fire management program is based on more than 30 years of scientific studies and research. As the program continues to mature, additional information will be needed to refine objectives and meet new challenges. New research needs and priorities would be identified by the Fire Management Office in conjunction with Yosemite's Resources Management Division research scientists from the Western Ecological Research Center, Yosemite Field Station.

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<sup>30</sup> Reference Manual 18, 2007; Research, Chapter 15

## A. EXISTING, ONGOING, AND NEEDED RESEARCH<sup>31</sup>

### 1. Existing Research

Information gaps in several areas have been identified. For example, the National Park Service continues to improve its understanding of Yosemite's fire history, and data on fire return intervals, season of burning, and fire severity is needed for vegetation types other than the giant Sequoia and ponderosa pine types (**Table 2**). Research is needed to better understand the structural component of lower elevation vegetation types, thus providing a basis for target conditions. These features include gap distributions, species composition, and density. As new remote sensing technologies develop, the fuel model map for the park would need to be refined, updated, and verified. Finally, additional information on the effects of fire on California black oaks, invasive non-native species, air quality, water quality, and sensitive species habits would improve Yosemite's fire program. Research also is needed on the influence of topography and smoke dispersion, as well as on short and long-term health effects from periodic smoke events.

To determine the most effective techniques for protection and preservation of cultural resources, Yosemite's fire management program must first understand more precisely how heat affects archaeological objects, how fire was used by indigenous people in managing specific plant resources and the pre-contact and prehistoric landscapes, and how fire can be used to restore and maintain historic and traditional landscapes. These data is used to develop protocols to avoid or mitigate the potentially damaging effects of burning. All efforts to conduct fire effects research at Yosemite are coordinated with the Pacific West Region, other NPS units, and other agencies.

A recent review and synthesis of literature on the effects of fire on cultural resources demonstrates that little systematic or rigorous research has been conducted on this topic (Ryan and Jones 1999). Many studies (e.g., Eininger 1990) consist of post-fire observations that cannot be compared to pre-fire data, thereby limiting their contribution to understanding the direct and negative effects of burning. A smaller number of studies (e.g., Picha et al. 1991) have been carried out in conjunction with controlled burns.

These experiments compare post-burn observations to pre-burn data but often lack information about important variables such as site-specific temperature and duration of heating. Laboratory experiments, notably Bennett and Kunzman (1985), have been conducted to simulate fire effects on various artifact types.

Existing research applicable to a unit's fire management program is examined to aid in determining desired ecological conditions, developing appropriate management goals and objectives, and writing appropriate treatment plans. This initial evaluation of existing research may also point out where additional research may be needed to aid in the development of management goals and objectives. Refer to RM 18 Research chapter.

### 2. Ongoing Research

There are two current research projects in the park that will significantly add to our understanding of the history of fire in the lower mixed conifer communities and impact of fuel reduction treatments on crown fire potential and visitor's experience in Yosemite Valley. The "1911 project" headed by Scott Stephens at UC-Berkeley will be completed in 2009 and will provide Park managers with a better understanding of pre-settlement forest structure and composition and fire history in that part of the Park that was surveyed by the General Land Office in 1911. Alan Taylor, the Pennsylvania State University will provide "renderings" of proposed fuel treatments in the inner WUI in Yosemite Valley. Alan's work will illustrate how fuel treatments will affect viewsheds in the Valley and fire behavior under a range of fuel treatment prescriptions.

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<sup>31</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Alternatives, Section II-49

### 3. Needed Research

The need for better data on fire effects on cultural resources is a nationwide issue (**Table II-12**). In addition, there is a need to standardize controlled burn and laboratory experiments that measure the effects of fire on cultural resources. These studies need to account for variation within cultural resource material types as well as variation in fire and environmental conditions. The end goal of these studies is to predict the effects of heating, under various conditions, on archaeological objects and the resultant loss of important information.

In addition to the effects of heating on particular material cultural objects, there is a need to understand the extent and objectives of indigenous (American Indian) and historic fire-based management of plant and animal resources. Specifically, how fire-based management affected the distribution, abundance, and diversity of wildlife and plant life is not well understood.

One of the objectives of prescribed fire in Yosemite National Park is to create a range in size of canopy gaps. Operationally, this means that our prescribed fires should create many small canopy gaps, some medium sized gaps, and only a few large gaps. Creating canopy gaps is ecologically important and operationally practical, however measuring them has not happened. We propose to use LiDAR to identify canopy gaps, measure their size (area) and qualify their ecological significance.

In 2006, California passed the Global Warming Solutions Act (AB 32), mandating that emissions of statewide greenhouse gases be reduced to 1990 emission levels. The California Air Resources Board was charged with developing and implementing a methodology for counting these greenhouse gas emissions from the different emission “sectors” in California, including the forestry sector. The contribution of fire emissions to this sector, if counted in absolute terms, can approach magnitudes equivalent to total emissions of medium to large cities in the case of the most catastrophic wildfires. Accordingly, fire is considered a significant threat to the carbon sequestration capacity of the landscape. However, a more comprehensive view requires that this initial loss must be balanced with longer-term dynamics which could actually result in net gains in carbon sequestration capacity depending on whether or not the same amounts and types of biomass grow back post-fire. Because forest regrowth can take decades to centuries, it is difficult to determine whether fires actually cause a net emission or sequestration at these longer timescales. We propose to measure carbon sequestered in our managed forest stands to determine if our current prescribed fire program sequesters more carbon than it emits or emits more carbon than it sequesters. These results may help us justify short-term air quality impacts for the long-term benefit of balancing the surrounding Counties carbon budgets.

## VIII. PUBLIC SAFETY<sup>32</sup>

### A. PUBLIC SAFETY ISSUES AND CONCERNS

The highest goal of the fire management program is safety, both of the firefighters and the public. Fire management involves a variety of risks associated with its operations. Aviation activities include loading and off loading personnel and supplies in unimproved helispots as well as water delivery and aerial ignition operations. Prescribed and wildland fires occur in complex terrain under a wide variety of weather patterns and burn wildland fuels that may have accumulated for over a century. Snags are commonly found in areas that have recently burned and in areas that have not burned in a long time.

The presence of park visitors and communities further complicates safety. The public is at risk from high intensity wildland fires burning near, and occasionally over, roads and communities. Smoke can cause health issues especially impacting more sensitive members of the public and can present a road hazard especially at night. The park’s wildland fire use, prescribed fire, and wildland fire suppression programs are very active, and the potential for firefighter fatigue requires careful monitoring and adherence to work/rest guidelines.

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<sup>32</sup> Reference Manual 18, 2007; Operations and Safety, Chapter 3

The reduction of risk to public safety and to natural and cultural resources as a result of unwanted, unnaturally high intensity wildland fires has been an underpinning of the Yosemite fire management program for decades. The use of prescribed fire and mechanical fuel techniques is intended to reduce risk to wildland/urban interface communities, and is a critical component of the Yosemite Fire Management Plan.

## **B. SPECIFIC PROCEDURES FOR MITIGATING SAFETY ISSUES**

Wildfires can strike suddenly, and the heavy volumes of visitation during the fire season, as well as the thousands of people who live in and near Yosemite Valley are additional factors in the management of large wildland fires. The presence of visitors and residents also complicates the Fire Use and Prescribed Fire programs, particularly because of the effects of smoke.

In conjunction with the Chief Ranger and the Superintendent, fire restrictions can be imposed especially when neighboring National Forests are also implementing restrictions. These may include a restriction on campfires, smoking, or other uses of fire by the public in specific locations or elevations, or even closures of specific areas to visitors when a fire is burning in that area. Yosemite National Park may also request Severity Funds to hire additional staff or contract for equipment because of unusually high fire danger.

Evacuation plans have been developed for various natural events such as floods. In the case of a fire emergency, evacuations will be executed by law enforcement personnel. Specific evacuation plans are under development for each of the six designated wildland urban interface areas within and adjacent to the park. As these evacuation plans are completed and distributed to community groups they will, in turn, be included in the respective community's Community Wildfire Protection Plan (CWPP). Fire Management will give information to the Park Superintendent and Chief Ranger, who will in turn develop and authorize any directive to implement closures or evacuations. Close coordination will also be done with the park concessionaire to ensure that guests are notified and tours and events can be cancelled or rescheduled.

## **IX. FIRE EDUCATION AND INFORMATION**

A comprehensive communication and education program emphasizes the entire scope of wildland fire management activities, particularly the role of fire in ecosystems. The following is a Fire Communication Plan which reflects the entire scope of the fire management program. For recommendations and additional direction Yosemite National Park utilizes NWCG's Best Practices in Communication Planning.

<http://www.nwcg.gov/teams/wfewt/bp/comm-planning.pdf>

### **A. FIRE AND VISITOR EXPERIENCES**

Early explorers in the Yosemite region reported open park-like stands of large ponderosa and sugar pine, California black oak, and other trees (Bunnell 1890; Clark 1894). Photographs of Yosemite in the 1860s and 1870s confirm that this situation existed in many areas, including Yosemite Valley and the giant sequoia groves. This forest structure, primarily maintained by natural fires and fires set by Miwok inhabitants, has largely disappeared. This change has not only disrupted natural ecological processes, but has also changed the look of the Valley and most of the western portion of the park. Today, visitors are affected by loss of historic vistas and forest openings, fewer opportunities to see wildlife because of habitat changes, and difficulties in off-trail hiking opportunities because of increased undergrowth.

### **B. FIRE EDUCATION ACTIVITIES AND OUTREACH**

While the Yosemite fire management program has a strong scientific foundation, the implementation of the Fire Use and Prescribed Fire programs is strongly affected by public knowledge of, and support for, these programs. The Fire Information and Education program will explain the goals and objectives of the fire management program to the public and media to increase awareness and support. The program will also provide a means of channeling reaction by the public and the media to the program's operations to fire managers for refinement of fire operations and planning.

### **1. Four goals of the Fire Education and Information Program:**

- Education on Yosemite fire history and ecology, and how the fire management program accomplishes natural and cultural resource management objectives;
- Provide timely and accurate information to the park staff, concessionaire, public, and media on fire incidents;
- Work with local communities and park neighbors to promote fire safety, prevention, defensible space and develop fire wise community fuels management plans;
- Partner with other agencies, communities, and educational institutions to improve fire management education and communication.

The Fire Education and Information Manager coordinates this program, which involves the participation of all park Divisions, community homeowner associations, park concessionaire, the U.S. Geological Survey, local, regional, and national media, and Yosemite Park partners such as the Yosemite Association, Yosemite Fund, and Yosemite Institute.

The Fire Education Manager serves as the liaison among these groups, involving the appropriate members of the fire management staff as needed. The FIO also serves as the media relations liaison when an Incident Management Team is working on a park fire incident. The team gathers and prepares media releases while the FIO reviews and revises the releases to ensure consistency with other park media messages.

### **2. Key Messages**

All five federal land management agencies use the same key messages about fire:

- Fire is an essential natural process;
- Society's influence has altered historic fire cycles, leading to a dangerous accumulation of vegetation and fuels in wildlands, especially near communities;
- The agencies are committed to a balanced fire program that will reduce risks and realize benefits of fire;
- Improve the health of the land and reduce risks to communities with partnerships among federal and state agencies, tribal governments, fire departments, communities, and landowners; and
- Public education is a part of the fire management program.

It is the role of the Park Fire Education and Information Manager to translate and interpret these national messages into specific examples from Yosemite National Park, involving aspects of science, monitoring, operations, and planning as well as the individuals who are engaged in these functions.

### **3. Six target audiences for Fire Education and Information:**

- Park visitors (including internet, general visitors, groups);
- Park employees (NPS, concessionaire, volunteers, park partners and associations);
- Local communities (especially Oakhurst, El Portal, Yosemite West, Groveland, Lee Vining, Wawona, Sonora, Mariposa);
- Students/Teachers (K-12, colleges, with emphasis on U.C. Merced, teacher associations);
- Media Relation Peers; and
- Professional Peers (other resource and fire agencies, professional associations).

There are a number of methods to deliver the messages to the audiences. These include interpretive programs, workshops, hosting professional meetings, smoke hotlines, recorded information, media interviews, public meetings, conference presentations, NPS and Concessionaire employee training, media releases, brochures, WebPages, email, postings, wayside exhibits, scientific papers, and special events.

There are a number of methods to deal with complex fire management issues. Appendix F shows a smoke communication strategy for Fire Use and Prescribed Fires. The smoke management issue is an excellent example of an aspect of the fire management program that may affect a variety of park employees, visitors, and neighbors, and will require a variety of methods and strategies to inform and educate the public on the fire management program. In turn, information and reaction provided by the public will influence when and how much can be allowed to burn, which individuals or audiences to focus on, and where to place air quality monitoring equipment.

Fire education and information is a critical part of the Yosemite Fire Management Plan. The attainment of the plan's goals and objectives for restoration and maintenance targets will be difficult if not impossible without an effective fire education and information program in place.

#### **4. Fire information capabilities and needs**

#### **5. Contact List for Planned/Unplanned (Rx) Ignitions**

- Fire Management Staff
- Agency leadership and staff beyond fire management
- Local emergency responders (police, structure fire)
- Clinics
- Neighbors (property owners, adjacent agencies)
- Local, regional, state, tribal, and national elected officials
- Local schools
- Newspaper, other media
- Researchers whose work may be affected
- Community members who have included a desire to know about project due to health or other issues

#### **6. Materials**

- Brochures describing positive aspects of fire
- Descriptions of anticipated projects and estimated dates for projects
- Maps for use in public information settings e.g., briefing maps for library lobby, courthouse, grocery stores

#### **7. Press Kit**

- Descriptive background documents
- Fact sheets
- Personnel profiles e.g., Superintendent, FMO

#### **8. Maps**

[Link to geomac.usgs.gov](http://geomac.usgs.gov)  
<http://www.firewise.org/>  
[http://www.nifc.gov/fire\\_info.html](http://www.nifc.gov/fire_info.html)

#### **9. Online Resources**

- Contact phone numbers
- Mechanism for public comment
- e.g., e-mail address, telephone number(s)
- “step-up” public information activities and capabilities<sup>33</sup>

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<sup>33</sup> Yosemite Fire Management Plan, 2004; Table IV-1

## **X. PROTECTION OF SENSITIVE RESOURCES**

### **A. SIGNIFICANT AND/OR SENSITIVE CULTURAL RESOURCES, AND MITIGATION MEASURES<sup>34</sup>**

Yosemite National Park contains a variety of cultural and archeological resources, structures, cultural landscapes, museum objects, and ethnographic resources. Each resource has a complex relationship with fire and Fire Management actions.

To ensure implementation of action alternatives protect significant and/or sensitive resources, a consistent set of mitigation measures are applied to actions that result from the Fire Management Plan. These mitigation measures are also applied to future actions that are guided by this plan. The National Park Service will prepare appropriate environmental review for those actions not covered in the 2004 Environmental Impact Statement for the Fire Management Plan. As part of the environmental review, Yosemite National Park will avoid, minimize, and mitigate adverse impacts when possible.

The requirements contained in the NEPA decision document (FMP/EIS, 2004) and Section 106 of the National Historic Preservation Act consultation documentation will be adhered to during the implementation of the fire management program.

Refer to Appendix D NEPA and NHPA compliance of the Fire Management Plan. Appendix D contains all the required mitigation measures for protection of cultural resources that are included in the environmental analysis and the Record of Decision.

### **B. CONSIDERATION OF DEVELOPMENTS, INFRASTRUCTURE, INHOLDINGS, AND OTHER IMPROVEMENTS NEEDING PROTECTION**

#### **Fire and Developed Areas**

Yosemite Valley, Wawona, El Portal, Foresta and the other communities and developed areas in and near Yosemite (Map 1-2) are all located within plant community types that have evolved under the influence of fire. For decades, aggressive fire fighting has helped protect private and public property, historic and cultural resources, and boundary areas. However, these actions have contributed to ever increasing accumulations of fuels in grass, woodland, and forest areas, and an increasing potential for large, high-intensity fires that are difficult to control. Fire suppression is becoming increasingly difficult and expensive, a pattern reflected throughout western wildlands.

Over the last two decades, public awareness about deteriorating forest conditions and the danger of wildland fires near communities has increased because of the large numbers of devastating fires across the western United States. In 2002, three states (Arizona, Colorado, and Oregon) experienced the largest wildfires in their histories. In 1990, the A-Rock Fire burned a significant amount of private and National Park lands in Foresta and the surrounding area and forced the closure of the park to the public for several days. This fire exhibited an unprecedented intensity in the Yosemite area, arguably attributed to the buildup of wildland fuels due to decades of fire suppression activities.

The specified areas require special consideration for protection. List actions necessary to prevent or mitigate negative impacts to these resources.

Refer to Appendix D NEPA and NHPA compliance of the Fire Management Plan for required mitigation measures for improvements.

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<sup>34</sup> Final Yosemite Fire Management Plan/Environmental Impact Statement, 2004; Affected Environment, Section III-3, III-40



# **XI. REVIEWS OF FIRE MANAGEMENT PROGRAMS, PROGRAM COMPONENTS, WILDLAND FIRES, AND THE FIRE MANAGEMENT PLAN**

## **A. WILDLAND FIRES AND FIRE-RELATED INCIDENTS REVIEWED**

All wildland fires and fire-related incidents will be reviewed in accordance with *Reference Manual 18, Wildland Fire and Program Reviews* chapter and the *Interagency Standards for Fire and Fire Aviation Operations*.

## **B. SPECIFIC STANDARDS AND PROCEDURES FOR THE REVIEW OF WILDLAND FIRES AND PRESCRIBED FIRES**

### **1. Annual Review<sup>35</sup>**

The Yosemite Fire Management Plan will be revised each year as additional knowledge and experience is gained from each fire season. After Action Reviews, prescribed fire critiques, Incident Management Team closeouts, and annual reviews conducted with other divisions will produce information which should be incorporated into the Yosemite Fire Management Plan. Information will also be used to refine fuels management projects and contacts for the upcoming year, especially following consultation with Firesafe councils, homeowners associations, and members of the public concerned with risk from wildland fires. Reviews and critiques will be done in accordance with guidelines in RM 18, Chapter 13. The Superintendent will review annual changes and revalidate the plan each spring.

### **2. Periodic Review**

The Yosemite Fire Management Plan/EIS describes a fuels management program which includes projects through 2009. A new multi-year project plan has been developed (Appendix I) that supersedes the EIS project. It will be updated annually and certified along with the Operational FMP. In 2009-10 the Yosemite Fire Management Plan EIS will be reviewed. If significant policy changes have occurred, the Fire Use Unit is proposed to expand extensively, greater than 20" diameter trees need to be mechanically thinned to achieve forest restoration targets, or other significant changes are needed in the fire management program, additional NEPA compliance will be done. It is anticipated that this will occur no later than 2014, when the Yosemite Fire Management Plan/EIS will be ten years old.

## **C. PROCEDURES FOR UPDATING THE FIRE MANAGEMENT PLAN**

### **1. Annual Fire Management Plan Update**

The Yosemite Fire Management Plan will be updated annually and the park will document the process, following the Annual Review. Annual updates to the Yosemite Fire Management plan are intended to keep the document current with policy and to ensure the fire management program includes a process of adaptive management to incorporate new knowledge, modernization, and the best available science. The annual update of the fire management plan is essential to ensure that the document continues to conform to current laws, objectives, procedures, strategies and terminology. An Environmental Screening Form will be utilized to document the environmental considerations during the update process.

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<sup>35</sup> Reference Manual 18, 2007; Evaluation and Review, Chapter 13

## **2. Critical Annual Updates**

Critical annual updates include renewal of cooperative agreements, updates of contact names and numbers used during emergency responses, current delegations of authority, and updates for any policy changes. Updates and modifications to the multi-year fuels treatment plan may not have to be made annually, but should be reviewed annually to ensure that project prioritization and proposed implementation schedules are current and any additional new fuels projects are consistent with environmental compliance requirements and developed in a collaborative process with neighboring communities and agencies.

## **D. FIVE YEAR REVIEW SCHEDULE FOR THE FIRE MANAGEMENT PLAN**

### **1. Interdisciplinary Review Process**

While five-year comprehensive reviews share similar purposes to the annual update process, the difference is that the five-year review includes a more intensive interdisciplinary approach to evaluating the fire management plan and program. The comprehensive review includes a broader consideration of new park planning direction, changing environmental or social conditions, new science, and adaptive feedback from fire program monitoring programs. The end result is to determine whether a major FMP plan revision and/or new environmental compliance process needs to be initiated. The Yosemite Interdisciplinary Review process will consist of a coordination with and consultation of the Division of Resource Management and Science and the Division of Interpretation.

### **2. Emerging Issues**

A five-year review of the fire management plan does not automatically initiate new planning requirements. If no new planning requirements are indicated by the review, the results are documented and signed by the superintendent. If the results of the review indicates that significant changes in proposed actions, expected effects, or changes in park a new plan and compliance document may be required. There are several emerging issues that Yosemite may be facing within the five year review process. First and foremost is the revised fire policy implementation guidelines, which eliminates wildland fire use as a separate fire type. While this change will allow managers the full range of response to all unplanned ignitions, interpretation of this change to park staff, the general public, and regulatory agencies will be an important task. This Operational FMP incorporates the new implementation language. In addition, a very likely emerging issue is how global climate change will affect Yosemite's many intricate ecosystems. Currently, Yosemite is expecting longer more intense fire seasons, as many other western parks are, as well. With an extended and more intense fire season the associated workload will also increase. With this said, how will these longer seasons with increased workload be effected by our ever restraining budget.

## XII. CONSULTATION AND COORDINATION

Many individuals and organizations developed the Yosemite Operational Fire Management Plan. Below is a list of all individuals and organizations that were consulted during the development of the plan. In addition to the listed parties, the following were also consulted during the coordination of the Yosemite Fire Management Plan:

California State Historic Preservation Officer	U.S. Fish and Wildlife Service
U.S. Geological Survey	National Park Service Water Resources Division
Advisory Council on Historic Preservation	Bureau of Reclamation- Sacramento
Department of Defense- Army Corps of Engineers	Stanislaus National Forest
Humboldt- Toiyabe National Forest	Inyo National Forest
Sierra National Forest	NPS Air Resource Division
NPS Denver Service Center	NPS Pacific West Region
NPS Pacific Great Basin Support Office	Pacific Southwest Forest and Range Exp Station
United States Attorney's Office	US Department of Interior Library
US Congressional Representative George Radanovich,	
US Senator Barbara Boxer	
US Congressional Representative John T. Doolittle,	
US Congressional Representative George Miller,	
US Department of Justice, US Department of Interior- Bureau of Land Management California State Office,	
US Environmental Protection Agency- Region IX	
USDA Natural Resource Conservation Service	
US Post Office- Yosemite National Park. <sup>36</sup>	

The following individuals have contributed greatly to the rewrite and policy updates to Yosemite National Park Operational Fire Management Plan

NAME	JOB TITLE	INPUT INTO THE OPERATIONAL FIRE MANAGEMENT PLAN
Kelly Martin	Chief of Fire and Aviation Management	Rewrite document to reflect new Fire Management Plan template
Deron Mills	Deputy Fire Chief of Operations	Preparedness Planning
Mike Beasley	Deputy FMO- Fuels	Updating language to reflect changes in policy
Gus Smith	Fire Ecologist	Fire Ecology and Monitoring
Gary Wuchner	Fire Education and Information Manager	Fire Education and Information
Joe Meyer	Branch Chief Physical Science	Resource Management and Science Review
Lee Tarnay	Physical Scientist/Air Resource Specialist	Air Quality and Monitoring
Rick Smedley	Regional Fire Planning (Retired)	Formatting and Review of Operational FMP, 2004
Kass Hardy	Environmental Planner	Formatting and editing of draft Operational FMP, 2008
Jim Shultz	NPS Training Specialist	NFDRS, Fire Danger Rating Operating Plan, Staffing and Action Guide

<sup>36</sup> Yosemite Fire Management Plan, 2004; Consultation and Coordination, Chapter XII

Annual FMP Review Checklist  
20xx  
Fire Management Plan Review and Update  
for  
Yosemite National Park

This annual review of the Fire Management Plan (FMP) is a requirement of NPS Reference Manual 18, Wildland Fire Management, as specified in the Fire Management Plan chapter, stating that “an annual review is essential to ensure that the FMP continues to conform to current laws, objectives, procedures, and strategies.” In addition, the current year Interagency Standards for Fire and Fire Aviation Operations states that the park superintendent will “identify resource management objectives to maintain a current FMP that identifies an accurate and defensible normal year readiness of funding and personnel”. The activities defined in the FMP will be implemented in accordance with agency and departmental policy, including recent procedural updates contained in the following documents:

- ✓ [NPS Wildland Fire Strategic Plan 2008 - 2012](#)
- ✓ [May 2008 Modification of Federal Wildland Fire Management Policy Guidance](#)
- ✓ [July 2008 Interagency Prescribed Fire Planning and Implementation Procedures Guide](#)
- ✓ [Interagency Standards for Fire and Fire Aviation Operations](#)

This review and update process is intended to keep the FMP as current as possible. Changes in the step-up plan, terminology, cooperative agreements, and adjustments to the multi-year fuels treatment plan are examples of appropriate revisions to a FMP using this review and update form. The updates identified in this document will become effective upon signature by the park superintendent.

Directions. Please review the following items from the FMP. If no updates are required, please check “no update”; if updates are required, please check “update included here”, and identify the specific update(s) in the space provided. Some items may require discussions with park resources management personnel. The updated information should be incorporated into the FMP and records kept in the park files. Send an e-copy of the document, as well as a fax copy of the signature page only, to: Regional FMO or regionally identified contact, and National FMO at the Fire Management Program Center in Boise.

**Step-up Plan**

The Step-up Plan should include:

- Accurate break-points between preparedness (staffing) levels
- Description of actions to be taken at each preparedness (staffing) levels
- No update
- Update included here:

**Multi-year Fuels Treatment Plan**

- No update
- Update included here

**Organizational Responsibilities**

- No update
- Update included here

**Preattack Plan**

The park should ensure the following documents are in place for 20xx:

- Rental Equipment Agreements (including Service and Supply Plan)
- Contracts for Wildland Fire Suppression and Prescribed Fire Resources
- Fire Call-up list

- Agreements, Annual Operating Plans, and related local interagency coordination documents
- Delegation of Authority (as specified on page 03-2 in Interagency Standards for Fire and Fire Aviation Operations) from the Park Superintendent to Appropriate Individual(s) for wildland fire activities and operations
- No update
- Documents have been reviewed, updated, and are on file at the park.

**Confirm that the following environmental compliance documents are still valid:**

- NEPA
- CE, EA, or EIS
- Decision Document (CE, FONSI, or ROD)

Notes:

**NHPA**

- Section 106
- Concurrence letter from SHPO

Notes:

**ESA**

- Section 7
- Concurrence letter from USFWS for informal consultation or signed
- Biological Opinion from USFWS for formal consultation

Notes:

**Communications and Education Plan**

- 2008 Modification of Federal Wildland Fire Management Policy Guidance Communication Plan
- The park should ensure that the contacts and protocol procedures are updated annually NOTE: If major changes in the wildland fire and/or fuels management program have occurred that do not conform to the existing environmental compliance documents, then these projects, or changes, should be suspended and a new compliance process completed for them.
- No update
- Update included

Prepared by: \_\_\_\_\_  
Chief Fire Management Officer

\_\_\_\_\_  
Date

Approved by: \_\_\_\_\_  
Superintendent

\_\_\_\_\_  
Date

## XIII. APPENDICES

Appendix A [References Cited](#)

Appendix B [Glossary of Fire Management](#)

Appendix C [Sensitive Species List](#)

Appendix D [Record of Decision](#)

[NHPA Section 106](#)

[USFWS Biological Opinion](#)

Appendix E **Unit Specific Supplemental Information**

[Fire Call-Up List](#)

Preparedness Inventory

[Cooperative Agreements](#) and Annual Operating Plans

Appendix F **Communication and Education Plan**

[Smoke Communication Strategy](#)

[Communicating with WUI Communities, USGS](#)

Appendix G **Wildland and Prescribed Fire Monitoring Plan**

Appendix H **Preparedness Plan**

[Initial Response, Dispatch, and Notification Plan](#) aka Yosemite Mini Mob Guide

Strategic fire size-up procedures

List of personnel available to assist with wildland and prescribed fires, including fire qualifications (See Appendix E & IQCS)

[Annual Delegation of Authority from Park Superintendent](#)

Job Hazard Analyses for fire and fire aviation activities

[Agency Administrator's Guide to Critical Incident Management](#) (NFES 1356)

Identify location of current fire cache inventory (*under development - Jackson*)

Service & Supply Plan (*under development - Jackson*)

Structure protection inventory and needs (*under development - Mills*)

[Backcountry Evacuation SOP](#)

Wawona Evacuation Plan

[Foresta Community Wildfire Protection Plan \(CWPP\)](#)

[Yosemite West Firesafe Homepage \(w/ link to CWPP\)](#)

[Minimum Impact Suppression Tactics \(MIST\)](#)

[MIST/MIMT Bibliography](#)

[Minimum Tool Decision Process](#)

[Snag Retention Guidelines –DRAFT–](#)

Fire Danger Operating Plan (*under development - Martin*)

Fire Duty Officer Guidebook (*under development - Mills*)

[Location of geospatial data for managing large fires](#)

[Park Aviation Management Plan](#)

[Intranet Map Page](#) (need staging areas, ICP/base camps, spike camps)

[Radio Frequency List](#)

Appendix I [Multi-year Fuels Treatment Projects](#)

Appendix J [Fire Prevention Plan](#)

Appendix K **Rental Equipment Agreements**

Appendix L **Contracts for Suppression and Prescribed Fire Resources**

Appendix M [Procedure in the Event of Serious Injury or Death](#)

Appendix N [DRAFT Handbook BAER](#)

Appendix O **Other Park Specific Appendices**