

ENVIRONMENTAL ASSESSMENT FIRE MANAGEMENT PLAN

DEVILS POSTPILE NATIONAL MONUMENT



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CHAPTER 1. PURPOSE AND NEED

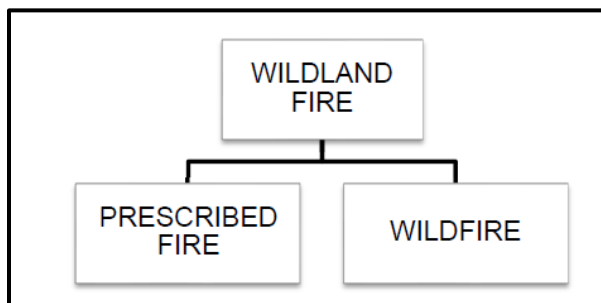
1.1 INTRODUCTION

The National Park Service (NPS) is proposing to update the Fire Management Plan (FMP; NPS 2005) for Devils Postpile National Monument (monument) to conform to current federal and NPS wildland fire management policies. FMPs are both planning and operational documents that promote the protection of life and property and sensitive natural and cultural resources, while defining a program to restore a more natural fire regime and foster a more fire resilient ecosystem.

The environmental assessment (EA) conforms to the National Environmental Policy Act (NEPA) of 1969 and its regulations (40 Code of Federal Regulations [CFR] 1508.9), NPS Director's Order 12 (DO-12) and Reference Manual 12 (RM-12) (2015), which direct the NPS NEPA process for projects, plans, and decisions. NEPA requires that every federal agency conduct an analysis of impacts for "major Federal actions significantly affecting the quality of the human environment," along with reasonable and feasible alternatives to those actions. Agencies are required to make informed decisions based on analysis conducted under NEPA and input obtained from the public and interested stakeholders. Upon close of the public comment period for this EA, the NPS will review and analyze all comments received and will amend to the EA to reflect modifications resulting from public comments raised. Substantive comments made on the EA will be summarized and discussed in the Finding of No Significant Impact (FONSI), the decision document produced following public review of the EA.

The term wildland fire is used throughout this EA, as defined in NPS Reference Manual 18: Wildland Fire Management (RM-12) (NPS 2014). Wildland fire is a general term describing any non-structure fire that occurs in vegetation and/or natural fuels. There are two types of wildland fire: planned ignitions and unplanned ignitions. Planned ignitions are also referred to as prescribed fire or prescribed burns. Prescribed fire is any fire intentionally ignited by management under an approved plan to meet specific objectives. Unplanned ignitions are those fires not intentionally ignited by management and are also referred to as a wildfire. Wildfire can range from unwanted fires that yield no benefits where full and rapid suppression is the objective, to those that can be safely and effectively managed with no or limited intervention to accomplish management objectives. A prescribed fire that has expanded beyond the prescribed burn plan, or escaped, may be declared a wildfire. These terms are used throughout the EA and are visually summarized in Figure 1.1.

Figure 1.1. Wildland Fire Types



This EA provides an assessment of the potential environmental impacts of implementing different fire and fuels management actions within the monument. The no action alternative continues the strategy of the 2005 FMP, which does not allow fuel reduction actions in designated wilderness (comprising 85% of the monument) and does not permit the management of wildfire for multiple objectives, including resource benefits. The proposed FMP revision would address wildfire and fuels management throughout the monument, including strategies for the suppression of unwanted wildfires, the management of wildfire for

multiple objectives, and the implementation of prescribed fire and manual treatments within wilderness and non-wilderness.

1.2 BACKGROUND

1.2.1 Devils Postpile National Monument

The monument was established on July 6, 1911, by Presidential Proclamation 1166. The purpose defined for establishment of the monument and reaffirmed in the Devils Postpile Foundation Document is to preserve and protect the glacially exposed columns of the Devils Postpile, the scenic Rainbow Falls, and the wilderness landscape of the Upper Middle Fork San Joaquin River for scientific value, public interest, and inspiration.

The monument is located in the central Sierra Nevada of California in Reds Meadow Valley (Appendix C, Figure C. 1). The closest communities to the monument are the town of Mammoth Lakes roughly 5 miles due east, Lee Vining and June Lake to the northeast (approximately 22 and 10 miles, respectively), and Bishop approximately 40 miles to the southeast. The only vehicle access to the monument is the steep, narrow, and winding Reds Meadow Valley Road that connects to Minaret Road at the west end of the town of Mammoth Lakes. Private vehicle use is highly regulated during most of the summer when visitors are directed to use a shuttle service to visit the monument.

The monument protects 800 acres of geological formations, mixed conifer forests, shrublands, and riparian and wetland communities. It is surrounded by Inyo National Forest (INF) lands and part of one of the largest contiguous wilderness complexes in the lower 48 states. Approximately 85% (687 acres) of the monument is federally designated wilderness managed in conformance with the 1964 Wilderness Act (Appendix C, Figure C. 2). The monument provides access to the 231,279-acre Ansel Adams Wilderness and the 651,992-acre John Muir Wilderness Area and John Muir Trail. The Pacific Crest National Scenic Trail, governed by the National Trails System Act (as amended 2009), traverses the northern section of the monument.

The Middle Fork of the San Joaquin River was found eligible in 1991 for designation under Section 5(d)(1) of the Wild and Scenic Rivers Act; this designation of eligibility was reaffirmed and updated in the 2015 General Management Plan (GMP). As an eligible river, its free-flowing values and water quality must be protected as a potential addition to the national system of Wild and Scenic Rivers.

Archeological evidence suggests that people have been present in the Devils Postpile and surrounding area as far back as 7,500 years ago. In addition, obsidian found within the monument suggests that the valley was used seasonally by tribes crossing the Sierra Crest west of present-day Mammoth Lakes and was probably part of a trade route from the Casa Diablo geothermal area, where the obsidian originated (NPS 2017a).

1.2.2 Monument Fire History

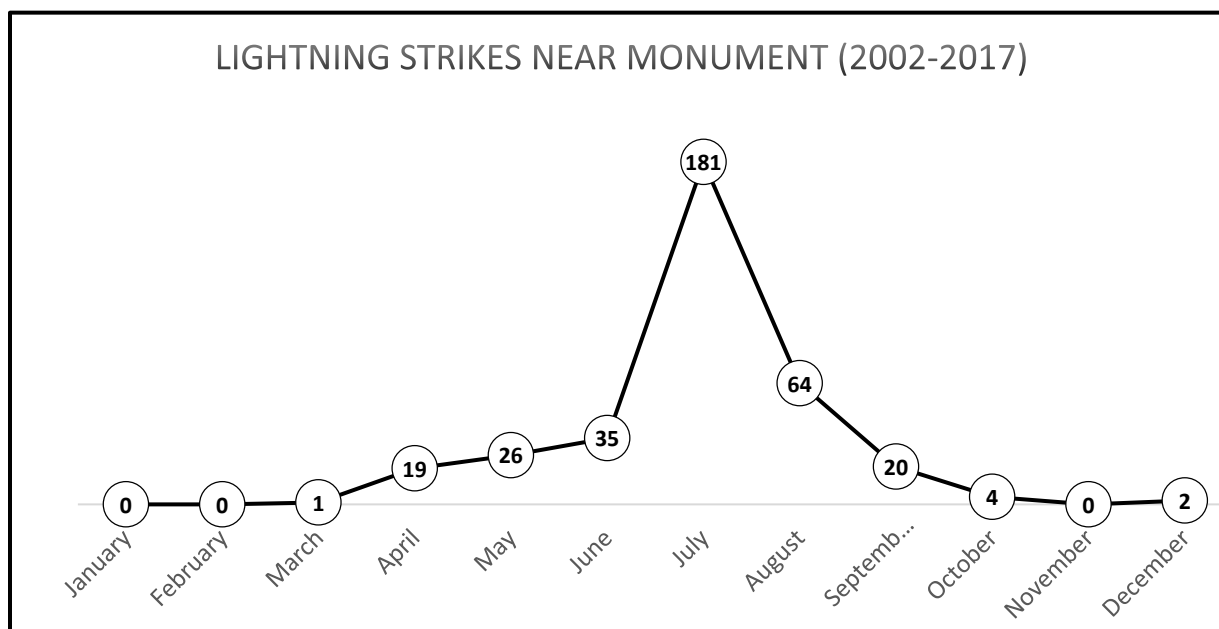
As throughout the Sierra Nevada, fire in the monument has played an integral role in the development and maintenance of most plant communities. Fire, ignited by lightning and Native Americans, was common in the Sierra Nevada prior to suppression efforts in the 20th century (McKelvey et al. 1996). Prior to Euro-American settlement, wildfires affected forest structure and composition, and many common plants exhibit fire-adapted traits such as thick bark and fire-stimulated flowering, sprouting, and seed release and/or germination (Chang 1996).

Fire frequency is influenced by elevation, aspect, and vegetation type. The mid-elevation coniferous forests of the monument have been subject to frequent lightning-ignited fires. Prior to the 18th century, lightning-ignited fire occurrence ranged from 3 to 30 years between fires, with an average interval between fires of 14 to 18 years in lower mixed-conifer forests and less frequent as elevation increased (Caprio et al. 2006). Research shows that these fires were predominantly understory burns rather than high-severity stand-replacing fires (Caprio 2004; Caprio et al. 2006; Caprio and Swetnam 1995; Swetnam et al. 1998).

Figure 1.2 shows the lightning strikes that have been recorded within an approximate 35-square-mile area around the monument from 2002 to 2017 (National Oceanic and Atmospheric Administration [NOAA] 2018). July has the highest number of lightning strikes recorded, while August is the second highest month of recorded strikes.

The natural occurrence and influence of fire was disrupted as a result of nearly a century of fire exclusion. In the absence of frequent understory burns, surface fuels accumulated, and forest density increased significantly, fire behavior and effects shifted from low to high intensity and severity, and vegetation species composition changed.

Figure 1.2. Total Lightning Strikes Near Monument



The most dramatic illustration of this shift was the lightning-ignited 1992 Rainbow Fire, which burned into the monument from its starting point 6 miles to the south on the INF (Appendix C, Figure C. 3). High winds (60+ miles per hour [mph]), combined with heavy fuel loading, dense conifer stands, and drought conditions, resulted in a high-intensity fire with severe fire effects that caused large patches of overstory tree mortality. Eighty-four percent of the monument burned with varying degrees of severity; more than 25% of the monument burned with high severity (Appendix C, Figure C. 4). In some high-severity sites, tree density declined from 1,260 trees per hectare (572 per acre) to 5 trees per hectare (2 trees per acre) (Caprio et al. 2006).

The Rainbow Fire was followed in 2011 by the Devils Windstorm, which uprooted thousands of live large-diameter trees within the monument (Appendix C, Figure C. 5) (Hilimire et al. 2013). Areas with dense live tree canopy that were located in unburned or low-severity areas from the Rainbow Fire were most severely impacted by the windstorm. These two events, along with over a century of fire exclusion, have led to an increase in fuel loading, increase in the areal extent of shrubland, decrease in forest canopy density, and alteration of the overall forest structure and composition.

Twenty-five years later, many of the high-severity burn areas from the Rainbow Fire, once dominated by forests, are still shrublands with little or no conifer forest regeneration. By contrast, areas of the monument that burned with low to moderate fire severity, where a local seed source still existed, there has been considerable post-fire forest regeneration (particularly white fir [*Abies concolor*]) (Caprio and Webster 2006).

NPS staff worked with the INF on several targeted fuel reduction projects, including a fuel reduction project around the administration area in 2005 and thinning and pile burning around the park administrative and campground areas in 2013 through 2015. A prescribed burn was conducted in 2015 (see Appendix C, Figure C. 3) in a portion of non-wilderness that had burned with low to moderate severity in the Rainbow Fire. The burn objective was to remove excessive fuel loading and to restore more natural forest conditions. The 2015 prescribed fire burned with low intensity and successfully reduced high fuel loading. This is visible to visitors where there is more open forest after the successful burn that removed the large build-up of fuels near and on top of the Postpile formation. The result was a decrease in high fuel loading, which met the objectives of the prescribed fire. This was an important first step in implementing phased projects to meet objectives. Additionally, post-burn survey data suggest that using prescribed fire in areas that experienced a low- to moderate-severity burn 25 years ago in the Rainbow Fire has helped reestablish a more natural fire return interval and improve forest resilience.

1.2.3 Fire Management Plans in the National Park Service

DO 18, Wildland Fire Management, requires that parks “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” (NPS 2008).

RM-18 identifies wildland fire management activities as “essential to the accomplishment of the NPS mission” and cites the following objectives from the 2014 National Cohesive Wildland Fire Management Strategy (NPS 2014:Chapter 1, pg. 4):

- Restore and Maintain Landscapes: Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
- Create Fire-Adapted Communities: Human populations and infrastructure can withstand a wildfire without loss of life and property.
- Respond to Wildfire: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

RM-18 requires that FMPs meet the specific resource objectives for that park and promote firefighter and public safety. The *Interagency Standards for Fire and Fire Aviation Operations* also known as the “Redbook” (U.S. Department of the Interior and U.S. Department of Agriculture 2018) further clarifies that FMPs do not expire and are considered valid until replaced by a new or updated FMP signed by the Superintendent.

1.3 PURPOSE AND NEED FOR THE ACTION

An update to the monument’s FMP is needed to bring the monument’s 2005 FMP into conformance with current federal and NPS Wildland Fire Management Policies and operational standards. Since 2009, the primary tenet of federal wildland fire management policy, across federal land management agencies, is to ensure “that the full range of strategic and tactical options are available and considered in the response to every wildland fire” (National Interagency Fire Center 2009). The 2005 FMP would be updated to reflect this comprehensive strategy.

As described under Section 1.2.2, Monument Fire History, environmental conditions within the monument have also significantly changed since the 2005 FMP was completed. An update is needed to more effectively meet management objectives, including managing the current high fuel loading, reducing the risk of a catastrophic wildfire, and thinning the forest to restore a more natural forest structure

The 2005 FMP does not allow for either prescribed fire or fuels treatments in the portion of the monument designated as wilderness (85% of monument acreage) or for the management of wildfire for multiple objectives. These limitations do not conform to the current federal wildland fire management policy, which

emphasizes that the full range of strategic and tactical options be available for use by firefighters in response to an unplanned ignition.

A revision of the 2005 FMP would permit the full use of strategies to mitigate the current risk of unnaturally severe wildfires. Based on data collected in fire monitoring plots (NPS 2003), total fuel loads during the first five years following the Rainbow Fire (1993–1997) increased slowly, followed by a rapid fourfold increase over the next 5 years (1997–2002). The accelerated rate of accumulation in the latter 5 years is attributed to the falling of dead standing trees killed by the fire (Caprio and Webster 2006). Plots indicate that fuel loading in unburned areas of the monument was similar to the 10 year postfire measurements (Caprio et al 2006) and has now increased with the addition of trees uprooted in the 2011 Devils Windstorm.

Additionally, in the most recent decade, the length of the fire season has been increasing due to warming temperatures and diminishing snowpack (Stephens et al. 2013; Westerling et al. 2006). Historically, most wildfires occurred in mid- to late summer through early fall. With longer fire seasons, fires may occur more frequently in early spring, impacting nesting birds and flowering and fruiting vegetation and greatly altering habitat conditions. A trend toward longer and more severe fire seasons has implications for human health (air quality), fire management capacity across the West, and the ecologic stability and resilience of plant communities that are adapted to shorter fire seasons and have experienced a buildup of fuels due to fire exclusion or high mortality of trees from severe wildfires.

The current FMP limits prescribed burning to the non-wilderness portion of the monument, although there is a buildup of fuels throughout the monument. Expanding the restoration and maintenance efforts into the wilderness portion of the monument would conform to current federal wildland fire management policy, reduce the risk of a high severity fire, restore a more natural fire regime and promote a more fire resilient ecosystem while protecting visitors and facilities in the monument, in the adjacent National Forest lands, and in the communities and resorts to the east. The revised FMP would help guide fire and fuel management activities within the monument over the next 20 years.

1.4 FIRE MANAGEMENT PLAN GOALS AND OBJECTIVES

The following goals and objectives would guide the monument's FMP update:

Goal 1. Manage all fire actions to reduce risk to the public and firefighters, and to protect monument development and infrastructure, and adjacent INF and community resources.

- a. Provide an appropriate suppression response to unwanted wildfire.
- b. Manage all wildland fire incidents in accordance with accepted interagency standards using appropriate management strategies and tactics and maximize efficiencies through interagency coordination.
- c. Meet annually in the pre-season with cooperators to identify areas and issues of concern.

Goal 2. Reduce the risk to natural and cultural resources from unwanted wildfire and from fire suppression operations.

- a. Promote low- to moderate-intensity fire as a means of attaining desired conditions and reduce the likelihood of high-severity fires like the 1992 Rainbow Fire.
- b. Use manual treatments (e.g., thinning, piling, and limbing), combined with prescribed fire, to reduce fuel loads, reduce risk of high-severity fire, restore natural fuel conditions, and restore a more natural fire regime.

Goal 3. Restore and maintain ecosystems, a more natural fire regime, and forest structure to increase resilience to the effects of wildfire and other stressors and preserve and enhance wilderness character.

- a. Use a combination of prescribed fire and manual fuels treatments to reduce fuel loading and restore forest structure.

- b. Manage lightning-ignited wildfire to restore the role of fire, increase ecosystem resilience, provide ecological benefits, reduce fuel loading, restore forest structure, and reduce suppression impacts.
- c. Use a combination of prescribed fire and manual fuels treatments to preserve the natural quality of wilderness and reduce the risk of catastrophic wildfire and the need for future trammeling from suppression actions.
- d. Develop adaptive fire management strategies for managing Soda Springs Meadow as a meadow refugium to support persistence of natural biodiversity.
- e. Consider the use of research burns to reduce conifer establishment in meadows.
- f. Manage fire and manual treatments to protect and enhance elements of wildlife habitat such as snags.
- g. Complete fuels and prescribed fire projects and maintain those benefits as lands transition to the Wildfire Maintenance Zone.

Goal 4. Collaborate with INF staff to develop interagency strategies, where appropriate, and to develop valley-wide wildland fire and fuels management activities.

- a. Working with the California federal interagency agreement for wildfire responsibility, NPS will continue to provide the annual delegation of authority for wildland fire response to the INF fire program. This letter of delegation will provide the conditions of delegation and the requirements for natural and cultural resource protection during fire response and coordinated fire management activities.
- b. Initiate a collaborative public safety planning process with INF, the Town of Mammoth Lakes, and the Mammoth Lakes Fire Protection District to develop a public safety fire response plan for monument that will address the feasibility of evacuation planning and identify areas within the monument that could be designated, improved, and provisioned as an in-monument safety zone(s) in the event of an emergency as an alternative or supplement to evacuation.

Goal 5. Promote public understanding of fire management program and objectives.

- a. Develop and publish interpretive material regarding wildland fire, prescribed fire, and fuels management activities for the public, the NPS workforce, and cooperating agencies.

Goal 6. Minimize or avoid unacceptable environmental impacts to natural and cultural resources from fire management operations.

- a. Use Minimum Impact Strategies and Tactics (MIST,¹ Appendix D).
- b. Assign Resource Advisors (READs) to wildfire on the monument when dictated by the values at risk.
- c. Increase Resource Advising capacity through training and qualifications for monument staff and collaboration with local cooperators (e.g., INF, Sequoia Kings Canyon National Park, Bureau of Land Management).
- d. Compile and organize monument resource data for use during wildfires (e.g., READ Guide, Wildland Fire Decision Support System [WFDSS] Objectives and Management Requirements).

Goal 7. Minimize air quality impacts of fire management activities.

- a. Provide Air Quality Advisories during wildland and prescribed fire events to inform the public and employees about current and expected conditions, and health concerns.

¹ MIST is also referred to as Minimum Impact Suppression Tactics.

- b. Work with Great Basin Unified and San Joaquin Valley Air Pollution Control Districts during all prescribed fire and wildfire management for multiple objectives operations to minimize smoke impacts.

Goal 8. Apply the best available science and monitoring to inform and prioritize fire and fuels management.

- a. Continue monitoring fire effects and forest regeneration plots.
- b. Continue long-term meteorological monitoring.
- c. Continue monitoring particulate matter (particulate matter less than 2.5 microns in size [PM_{2.5}]) during the summer months.
- d. Identify information gaps that hamper science-based decision making and solicit fire research to help fill these gaps.
- e. Investigate past and expected fire effects to better anticipate vegetation community change.
- f. Investigate the effects of fire on potential climate change refugia under different climate change scenarios.
- g. Investigate the effectiveness of fire or fuels treatments on reducing conifer establishment in meadows.
- h. Investigate the effectiveness of fire type and timing on reducing invasive plants in meadows.
- i. Collaborate with the Sierra Nevada Inventory and Monitoring network, U.S. Geological Survey, local research stations, and universities to facilitate fire research at the monument and the greater Sierra Nevada region.
- j. Investigate the effects of a changing climate on the fire regime and fire effects in the monument.

Goal 9. Minimize the impacts of undesirable post-wildfire conditions on human safety, infrastructure, and natural, cultural, and wilderness values within the monument.

- a. Following every wildfire within and adjacent to the monument, assess the need to implement Emergency Stabilization/Burned Area Emergency Response (ES/BAER) and/or Burned Area Rehabilitation (BAR) to: a) protect human life, property, and critical natural and cultural resources from emergency post-fire conditions, and b) stabilize, restore, or enhance the functionality of burned ecosystems, and repair or replace minor infrastructure damaged by wildfire or post-fire events.
- b. Develop standard operating procedures for ES/BAER and BAR that are consistent with monument fire management goals and objectives related to firefighter and public safety, infrastructure and protection of natural, cultural and wilderness values.

1.5 RELATED GUIDANCE DOCUMENTS AND PLANS

In addition to the federal wildland fire management policy documents that apply to the primary federal land management agencies, FMPs integrate and seek to implement guidance provided in monument-specific documents. These related documents and the guidance relevant to fire management planning are in Appendix H.

1.6 SCOPING FOR THE DEVILS POSTPILE NATIONAL MONUMENT FIRE MANAGEMENT PLAN

Public scoping for the monument's FMP EA was conducted from January 8, 2018, to February 16, 2018. NPS staff held a public scoping meeting jointly with INF staff during this period and made presentations at a local government council and tribal councils and discussed the FMP update with the local fire chief.

A summary of the public scoping process, the presentations made by the NPS, and scoping comments received is in Appendix E.

1.7 IMPACT TOPICS RETAINED FOR FURTHER ANALYSIS

Impact topics to be retained for further analysis in this EA were identified during the scoping process based on input gained from public and agency staff at official meetings, from scoping comments submitted directly to the NPS, and from NPS staff familiar with the monument resources and NPS wildland fire management.

NPS NEPA guidance directs that issues should be retained for consideration and assessment in the EA if:

- the environmental impacts associated with the issue are central to the proposal or of critical importance;
- a detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives;
- the environmental impacts associated with the issue are a big point of contention among the public or other agencies; or
- there are potentially significant impacts to resources associated with the issue (NPS 2015).

Table 1.1. summarizes the impact topics that are analyzed in detail in this EA. This list of impact topics was developed by the NPS, based on input solicited from the public and public agencies during the scoping period and input from NPS staff during internal scoping.

Table 1.1. Impact Topics Retained for Detailed Analysis

Impact Topic	Issues to be Addressed
Air Quality	The EA will address the potential impacts of smoke generated by prescribed burning or wildfire management for multiple objectives on the Class I airshed of the Ansel Adams Wilderness. Localized smoke impacts from fire management actions on public health of nearby residents and visitors will also be addressed.
Vegetation, Wetlands, and Sensitive Plant Species	The EA will address the potential impacts to vegetation communities from fire management actions, including from prescribed fire, suppression operations, managing unplanned ignitions for multiple objectives, and manual fuels treatments conducted for defensible space and to prepare areas for prescribed burning.
Wildlife and Special-Status Wildlife Species	The EA will address potential for FMP actions to impact wildlife and wildlife habitat and a federally listed threatened wildlife species, the Yosemite toad (<i>Anaxyrus canorus</i>).
Wilderness Character	The EA will address the potential for fire management actions to affect wilderness character.
Visitor Experience	The EA will assess how fire management activities could impact public access, recreation, public safety and the visitor experience at the monument.
Cultural Resources	The EA will address the potential for FMP actions to affect cultural resources within the monument.

1.8 IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

Table 1.2 summarizes the impact topics that were considered but dismissed from further analysis because either the resource or issue is not present in the areas proposed for management action or, because there are no anticipated impacts to the resource or issue from the alternatives.

Table 1.2. Impact Topics Dismissed from Detailed Analysis

Impact Topic	Discussion of Effect
Socioeconomics of Gateway Communities	Fire management activities would be of short duration and small scale and would typically employ NPS crews from parks in the region and U.S. Forest Service crews stationed in nearby forests. Fire management actions would have no discernible impact on local population, income, or employment in neighboring communities, nor would the proposed management actions have a measurable impact on the local or regional economy. Therefore, this impact topic will not be addressed further in the impact analysis.
Soils and Water Resources	The proposed fire management actions incorporate techniques to minimize impacts to soils and water resources, including the exposure of surface soils during and immediately after a wildfire is suppressed, which can lead to erosion of sediments into waterbodies, if not addressed. Minimum Impact Strategies and Tactics or MIST (see Appendix D) have been developed to mitigate the effects of fire management actions to soils and water resources. The tactics aim to prevent soil erosion and avoid subsequent sediment flow into water resources and would be implemented to reduce the potential adverse effects on soils and water resources. Thus, this topic is dismissed from further analysis. Potential impacts to wetlands are addressed in Section 3.3, Vegetation, Wetlands, and Sensitive Plant Species.
Land Use	The proposed update of the FMP for the monument would not result in any changes to existing land use within or adjacent to the monument. The topic is dismissed from further analysis.
Public Safety	<p>In accordance with NPS Management Policies (2006), the NPS seeks to provide a safe and healthy environment for visitors and employees. Concern for public safety is one of the primary goals and drivers of the FMP update. FMP goals 1, 2 and 4 articulate the priority given to public safety. These goals acknowledge that areas of the monument require active management to reduce high fuel loading so as to reduce the risk of catastrophic fire by improving forest conditions and resiliency. All fire management activities will be conducted to mitigate risk from unwanted wildfire and improve forest conditions, while providing for firefighter and public safety. Policy includes but not limited to, the Redbook, DO 18, and the Standards for Operations and Safety chapter in NPS RM-18 (NPS 2014).</p> <p>The NPS acknowledges in Goal 4B and in project 3.15 that the tactical public safety issues for the monument, such as provisions of safety zones and evacuation planning need to be part of a larger cooperative planning effort with the INF and community stakeholders that is outside the scope of the FMP and interagency planning will be coordinated by NPS.</p> <p>Potential impacts of fire management on public health from the release of airborne constituents are discussed in Section.2, Air Quality, and potential impacts to visitor safety are addressed in Section.5, Visitor Experience.</p>
Night Sky	Actions associated with the proposed FMP update would be limited to light sources used by firefighters when monitoring or managing wildfires or prescribed fires during the night. These impacts would be of short duration, would occur very infrequently, and would not have a discernible effect on the characteristics of night sky in the monument.
Traffic and Transportation	The proposed update of the FMP for the monument does not involve actions that would generate increased levels of traffic to the monument, interfere with the shuttle service to the monument, or create unsafe traffic conditions within or adjacent to the monument. The topic is dismissed from further consideration.
Environmental Justice	Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, requires federal agencies to assess whether their actions have disproportionately high and adverse human health or environmental effects on minority and low-income populations. There are no proposed FMP actions that could disproportionately impact these populations. The issue is dismissed from further consideration in the EA.
Indian Trust Resources	Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of the Interior agencies be explicitly addressed in environmental documents. Indian trust resources are those resources held in trust for Indians by the federal government. The issue is dismissed from further consideration in the EA because there are no Indian trust resources in the monument.

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CHAPTER 2. ALTERNATIVES

NEPA requires federal agencies to explore a range of reasonable alternatives aimed at addressing the purpose, need, and objectives of the proposed action, in this case, the update to the monument's FMP. The alternatives under consideration must include the "No Action" Alternative as prescribed by the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1502.14). This chapter describes two alternatives for the FMP, Alternative A: the No Action Alternative (continued implementation of the strategy adopted in the 2005 FMP) and Alternative B: the Preferred Alternative (revision of the 2005 FMP, which is also the NPS Preferred Alternative).

2.1 OVERVIEW OF ALTERNATIVES

Based on input from internal and public scoping, preliminary consultation with permitting agencies, examination of regional fire history and trends, monitoring data, and current research, the NPS proposes two alternatives for examination in the EA. Alternative A: (No Action) Full Suppression with Limited Fuels Treatments would maintain the current strategy as outlined in the 2005 FMP, where all naturally-ignited and human-caused wildfires are suppressed. Fuels treatments, including prescribed fire, would be limited to the non-wilderness portion of the monument under Alternative A. Alternative B: Targeted Suppression with Limited Managed Wildfire and Monument-wide Fuel Treatments proposes an update to the monument's fire management strategy that would allow for restoring natural forest conditions on both wilderness and non-wilderness, while reducing the risk of catastrophic wildfire. Alternative B, the NPS's Preferred Alternative, would allow for the suppression of all unwanted wildfire, the management of wildfire for multiple objectives when conditions are favorable, and fuel reduction projects through prescribed fire and manual fuel treatments that would improve forest condition and resiliency (Table 2.1).

Table 2.1. Comparison of the No Action Alternative and the Preferred Alternative

Main Program Elements	Alternative A: No Action Alternative	Alternative B: FMP Revision (Preferred Alternative)
Fire Management Units	Zones not designated	Three zones: General Wildfire Protection Zone, Wildfire Restoration Zone, and Wildfire Maintenance Zone
Response to Unplanned Wildfire	All unplanned ignitions would be suppressed using appropriate management techniques to limit the spread of all fires as quickly as possible, ensure public and firefighter safety, protect the monument's natural and cultural resources, and contribute to protecting other private and public property. The need for fire suppression repair, BAER, or BAR activities would be assessed post-wildfire.	<ul style="list-style-type: none"> • Manage naturally ignited wildfire, where appropriate, to increase ecosystem resilience, provide ecological benefits, reduce fuel loading, restore forest structure, and restore a more natural fire regime. • Suppress unplanned human-caused wildfire. • The need for fire suppression repair, BAER, and BAR activities would be assessed post-wildfire.
Manual Treatment	Permitted only in non-wilderness portion of the monument.	<ul style="list-style-type: none"> • Manual treatments would occur in all zones. • Manual treatments in the General Wildfire Protection Zone would focus on defensible space around structures and campground, preparation for prescribed burning, thinning, and limbing to reduce fuels. • Manual treatments in the Wildfire Restoration Zone would focus on breaking up large accumulations of dead and downed fuels, reducing fuel loading, limbing up and thinning small-diameter trees in preparation for prescribed fire events, and to support active management of naturally ignited wildfires.

Main Program Elements	Alternative A: No Action Alternative	Alternative B: FMP Revision (Preferred Alternative)
Prescribed Fire (including broadcast burns and pile burns)	Permitted only in non-wilderness portion of the monument.	<ul style="list-style-type: none"> Prescribed fire could occur in all zones. Prescribed fire could focus on understory low- or moderate-intensity fires in forested areas. Prescribed fire may be used to deter conifer establishment into meadows.
Wilderness Minimum Requirements Analysis (MRA)	Programmatic compliance for initial response to wildfires and individual MRAs for each manual or prescribed treatment.	Same as Alternative A.
Minimum Impact Strategies and Tactics	Tactics would continue to be used on all fire management activities.	Same as Alternative A.
Resource Advisors	Consider for all fires over 10 acres.	Assigned to wildfires based on the values at risk in accordance with WFDSS and READ Guide.

2.2 DESCRIPTION OF FIRE MANAGEMENT ACTIONS

The two FMP alternatives would employ many of the same types of wildland fire and fuels management actions, but differ greatly regarding where in the monument the actions could be employed, how the actions would be carried out, and under what circumstances. The EA provides descriptions of the common elements of each of the actions.

2.2.1 Consideration of Fire Management Actions in Wilderness

The majority of the monument, 687 acres, is part of the Ansel Adams Wilderness. Wildland fire operations within the proposed wilderness area would adhere to the requirements of the Wilderness Act, NPS Management Policies (2006), DO-18 *Wildland Fire Management*, and DO-41 *Wilderness Preservation and Management*.

All fire management activities affecting designated and potential wilderness within the monument must be evaluated using the minimum requirements analysis (MRA). This planning tool and documentation process is used to determine whether administrative activities affecting wilderness resources or the visitor experience are necessary, and if so, what techniques and tools are needed to minimize impacts to the wilderness resource. The MRA is applied as a two-step process: 1) the NPS determines whether the proposed fire management action is necessary or appropriate for administration of the area as wilderness and does not cause a significant impact to wilderness resources and character; and 2) if the action is necessary/appropriate, the agency analyzes the techniques and types of equipment needed to ensure that impacts on wilderness resources and character are minimized.

To fulfill this requirement, a programmatic MRA has been developed to guide initial wildfire responses within wilderness (see Appendix G, Programmatic Minimum Requirements Analysis). This programmatic MRA is anticipated to guide most fire management activities that could occur within wilderness. However, long-duration fires may require other actions not considered in the programmatic MRA and therefore would require the development of an event-specific MRA to evaluate those tools and/or strategies not currently considered and analyzed in Appendix G. In those exceptional cases, prior approval by the Superintendent would be required in the form of a signed MRA document specific to the event.

2.2.2 Wildfire Suppression

In accordance with NPS RM-18, the “initial actions on human-caused wildfires will be to suppress the fire at the lowest cost with the fewest negative consequences with respect to firefighter and public safety.” For Alternative A, suppression would occur for all unplanned wildfires, whether human or naturally caused. Under Alternative B, suppression would occur on all human-caused wildfires; however, naturally caused wildfires may not be fully suppressed, but managed for multiple benefits. Wildfire suppression details for each alternative are described under Sections 2.3 (for Alternative A) and 2.4 (Alternative B).

Under both alternatives, wildfire suppression strategies would be implemented to curtail fire spread and minimize threats. Depending on the location and nature of each fire, ground and/or aerial firefighting resources are used to contain a fire to the smallest possible size. A range of fire suppression techniques would be used to break the continuity of forest fuels, cool the fire, and slow the advance of a flaming front. Actions may include construction of firelines; cutting of vegetation; application of water; and application of fire. In addition, suppression tactics would depend on whether the wildfire occurs in wilderness or non-wilderness and whether a wildfire in non-wilderness is accessible to vehicles.

Small wildfires would be suppressed using hand tools—sometimes supported with a chainsaw for cutting fuels, a portable pump for delivering water, and/or a helicopter to transport water, supplies, and firefighters. Helicopters would not be allowed to land within the monument for routine actions. Fire engines and other vehicles would be restricted to the existing roads in the non-wilderness portion of the monument. Larger fires or fires with greater spread potential may require the use of retardant-filled aircraft (with superintendent approval) or extensive water drops. Other actions to suppress wildfire and to reduce residual smoke include mop-up activities such as felling snags, trenching to prevent burning debris from rolling, water application, and cold-trailing (checking for residual heat or embers in litter and duff). The area would be patrolled to prevent, detect, and suppress spot fires and hot spots beyond the fireline. Staging areas for equipment, command centers, and crew camps would likely be established outside of the monument. Electronic devices, including but not limited to, GPS units for mapping and locating fires, and cell phones and portable radios for communications would be in use. Activities would provide for firefighter and public safety as the highest consideration, but would also consider the impacts to resource values, economic expenditures, and the use of critical firefighting resources. INF fire crews would be the first responders to a wildfire in the monument, and the response determination would be based on the risk assessment of the initial responding crew in consultation with fire management specialists and the Superintendent.

Fire suppression repair is a series of immediate post-fire actions taken to repair damage and minimize potential soil erosion and impacts resulting from fire suppression activities and usually begins before the fire is contained and before the demobilization of an Incident Management Team. This work would include the repair of firelines, roads, trails, safety zones, and drop points used during fire suppression efforts.

A BAER team may be called in during or after the suppression effort to develop a plan to rehabilitate monument resources impacted by wildfire. The BAER team would identify emergency threats to human life, property, and critical natural and cultural resources. Non-emergency, longer-term threats and damages to minor infrastructure would be addressed via BAR. BAER/BAR treatments are developed based on impacts observed or anticipated. These may include treatments to address soil disturbance, erosion and compaction, sediments or excessive debris entering waterways, damage to roads and trails, spread of non-native invasive plant species, damage to cultural resource sites, and hazardous trees near public use areas. BAER activities may require a standalone MRA.

2.2.3 Manual Fuels Treatment

Manual fuels treatments using hand tools would be the primary method to thin vegetation in the monument or prepare an area for a subsequent prescribed fire. Manual fuels treatments would be used to cut, clear, or prune herbaceous and woody vegetation (NPS 2014). A prescription for vegetation removal would be in effect for each manual treatment and would use the standards (including size and number of trees) developed by Sequoia and Kings Canyon National Parks. Tools used include handsaws, axes, shovels, rakes, pulaskis, McLeods, and hand clippers and power tools such as chainsaws and power brush saws and weed whips. Manual fuels treatments would be used to create defensible space around monument structures and to thin the forest surrounding the campground and administrative areas. Mechanical fuels treatment, which rely on wheeled or tracked heavy equipment with attached cutting or crushing implements, would not be used under either alternative.

Prior to conducting a prescribed fire, manual fuels treatments would be used to prepare identified perimeters, improve trails, and strengthen natural barriers that serve as burn unit boundaries with an adequate fireline. Within this area, shrubs and small-diameter trees would be removed and lower branches from larger trees

limbed. The area of reduced fuels may be 10 to 20 feet wide. Trees are limbed up to prevent fire from spreading from the understory vegetation into the forest canopy. Dense stands of small-diameter conifers would be thinned to reduce fire intensity along firelines. Surface fuels would be raked and removed down to bare mineral soil up to three feet wide. Manual fuels treatments may also be used to reduce fuels to protect isolated cultural resource sites within prescribed fire boundaries. In the non-wilderness area of the monument in the northeast, west of the river, mechanized wheel barrows could be used along the trail system to transport equipment and fuel. Outside of the roadway and parking facilities in the administrative area and campground, there is no vehicle access in the monument.

2.2.4 Prescribed Fire

A prescribed fire (also referred to as a prescribed burn or broadcast burn) is any fire intentionally ignited by management under an approved plan to meet specific objectives (NPS 2014). Prescribed fire is used to alter, maintain, or restore vegetative communities; restore or maintain ecosystem health; and protect life, property, and values that would be degraded or destroyed by wildfire (National Wildfire Coordinating Group [NWCG] 2017). Prescribed fires focus on the consumption of surface fuels and dead, downed vegetation, and reduction of unnaturally high forest tree density, particularly small trees. In some cases, prescribed fire can be used to thin denser stands of smaller trees or reduce thickets of shrubs. In the monument, prescribed burns would normally be conducted jointly by NPS and INF fire management staffs. Projects would be prioritized in a 5-year implementation plan and reviewed annually to confirm priorities.

All prescribed fires require written burn plans that are peer-reviewed and approved by the Superintendent. All prescribed fire plans must follow the NWCG template (Product Management System [PMS] 484-1; NWCG 2017a). The template requires a description of how the project will comply with air quality regulations at all levels of government, what permits are needed, identification of smoke sensitive receptors, mitigation strategies to reduce impacts, and smoke dispersal monitoring procedures. Personnel responsible for executing prescribed burns (Burn Bosses) must be qualified at the appropriate NWCG complexity level. Most burns at the monument would be moderate complexity (Type 2) with the possible exception of pile burning. Smoke management plans for each burn are also submitted to the San Joaquin Valley Air Pollution Control District (Air District) for review and approval. The burn plan describes the following:

- pre-defined burn unit boundary with any subunit divisions (segments)
- burn objectives
- measurable prescription criteria such as fuel moisture, relative humidity, and wind speed and direction
- the process for obtaining fire weather forecasts
- the minimum required number of firefighters and equipment
- the type of firing tool
- the firing and holding plans objectives and desired fire behavior characteristics
- monitoring procedures
- air quality and public health considerations
- measures to be taken to reduce the impacts of the operation

The burn boss implementing the burn plan must receive an approval to proceed from the Air District on the day of the burn to ensure air quality conditions are met.

Each prescribed fire is directed by a prescribed fire burn boss and managed and monitored by qualified personnel. The boundaries of burn units are planned to conform to existing barriers in the landscape, such as roads and trails or geologic features, but may also rely on the fireline constructed by fire crews. Water pumps and hoses may be deployed by hand or lowered by helicopter to more remote burn units to allow pumping of

river water to hose lays along the fireline. Prior to burn ignition, firelines are constructed to contain the burn within the management unit. Drip torches, using a diesel or gasoline mixture or similar ground-based firing tool, are used to ignite the burns using specific ignition patterns to achieve burn objectives. Once the burn is ignited, crews patrol the perimeter of the fire along firelines and mop up hot spots where necessary, as determined by the burn boss. After that, periodic patrols are conducted to ensure that no lingering smoke or heat is detected until it is declared completely out.

Prescribed burns that exceed the scope of the approved prescribed burn plan (unit boundaries, weather parameters, smoke emissions) may be reclassified as a wildfire and suppressed.

2.2.5 Pile Burning

Pile burning is type of prescribed fire used to ignite piles of cured, cut vegetation resulting from fuel reduction projects. Pile burning requires an approved peer-reviewed prescribed burn plan; approval is also required from the Air District. The burn plan would have the same elements as a broadcast burn plan. In the monument, piles are generally burned during the winter with snow on the ground to reduce damage to surrounding vegetation, reduce the risk of fire spread, and minimize impacts to underlying soils by confining the impacts to the immediate footprint of the pile.

2.2.6 Minimum Impact Strategies and Tactics

MIST would be implemented under both Alternatives A and B. The objective of using MIST is to reduce resource damage from fire management actions while minimizing costs and providing for firefighter and public safety. MIST is a framework for conducting fire management actions by selecting strategies that cause the least impact on resources while allowing for the management of the fire's existing or potential behavior. Like the philosophy behind the MRA required for the assessment of appropriate tool use in wilderness, MIST directs firefighters to use the minimum tool in terms of resource impact to safely and effectively accomplish a task.

"Use of MIST must not compromise firefighter safety or the effectiveness of management efforts. Safety zones and escape routes must continue to be a factor in determining fire line location" (NPS 2014).

MIST used within the monument is listed in Appendix D.

2.2.7 Monitoring and Research

Under both alternatives, the NPS would continue collaboration with the Sierra Nevada Inventory and Monitoring Network, U.S. Geological Survey, local research stations, and universities to facilitate fire research at the monument and the greater Sierra Nevada region. Monitoring of fire effects and forest regeneration plots would continue, as would long-term meteorological monitoring and particulate matter (PM_{2.5}) monitoring during the summer months. New plots may be installed in treatment units prior to fire and fuels management activities. Monitoring results would be used to fine-tune prescriptions, as necessary, to ensure resource management objectives were achieved. Monitoring and research in wilderness would include monitoring for severe fire effects and severe windstorm blowdown.

2.3 ALTERNATIVE A (NO ACTION ALTERNATIVE): FULL SUPPRESSION WITH LIMITED FUELS TREATMENTS

Under Alternative A, the monument would continue with implementation of the FMP strategy adopted in 2005. All human and natural-caused unplanned ignitions would be suppressed throughout the 800-acre monument. Manual fuels treatments and prescribed fire could be implemented to reduce fuels in the northeastern 15% (approximately 113 acres) of the monument that is not wilderness (Appendix C, Figure C.6). Under Alternative A, fire management actions in the non-wilderness would focus on achieving natural and cultural resource objectives and reducing fuel loading. Manual fuels treatments would also be

used to maintain defensible space around monument structures and thin vegetation surrounding the campground and day use area.

2.3.1 Full Suppression of Wildfire

Under Alternative A, all naturally ignited and human-caused wildfires would be suppressed throughout the monument. Suppression is conducted by extinguishing or confining a wildfire beginning at its discovery (NWCG 2012). Full suppression does not allow for the management of naturally ignited wildfires for fuel reduction and resource benefit. Under the existing FMP strategy of Alternative A, a wildfire ignited by lightning and burning under ideal conditions that could benefit resources and reduce fuels would have to be suppressed. This would include a fire being managed for resource benefits by the INF that would burn into the monument from adjacent National Forest System lands.

Full suppression efforts are described under Section 2.2.2, Wildfire Suppression.

2.3.2 Manual Fuels Treatments

Manual fuels treatments would be used to reduce hazardous accumulations of fuels around structures and developed areas to decrease the likelihood of fire damage to monument infrastructure. Manual fuels treatments would only occur within 113 acres of non-wilderness. Manual fuels treatments would likely involve follow-up pile burning or prescribed fire to reduce the volume of cut vegetation from the manual treatment. Under Alternative A, manual fuels treatments would be conducted as described in Section 2.2.3.

With assistance from NPS staff from Sequoia and Kings Canyon National Parks, INF fire management staff, and staff from other national parks in the Sierra NPS Network, the monument would evaluate the need for and possibly implement manual fuels treatments on approximately 25 acres in the monument per year over 5 to 7 days per occurrence.

2.3.3 Prescribed Fire

Under Alternative A, a prescribed fire could only be conducted on the 113 acres of the monument that are not designated as wilderness. No prescribed burns would be conducted in the 687 acres of wilderness.

2.3.4 Pile Burning

Under Alternative A, pile burning would be conducted as described in Section 2.2.5. However, pile burning would be restricted to the 113 acres of non-wilderness. Approximately 100 piles per occurrence, once per year would be burned under Alternative A. Pile burning would not be used to reduce the large accumulations of fuels (snags and downed trees) from the 2011 Devils Windstorm that currently exist in the 687 acres of wilderness.

2.3.5 Resource Advisors

Resource Advisors will be assigned as dictated by values at risk (i.e., information contained in Resource Advisor guides/databases, WFDSS, etc.). Annual pre-season meetings with cooperators can be used to identify areas and issues of concern.

2.4 ALTERNATIVE B: TARGETED SUPPRESSION WITH LIMITED MANAGED WILDFIRE AND MONUMENT-WIDE FUELS TREATMENTS

Alternative B, the NPS Preferred Alternative, would update the monument's FMP to conform to current federal and NPS wildland fire management policy that allows the full range of strategic and tactical options to be available and considered in the response to every wildland fire. Alternative B would allow for wildfire and fuels management throughout the monument, including the 85% of the monument that is designated as wilderness.

Alternative B includes strategies for the suppression of unwanted wildfires, the management of some wildfires for multiple objectives, including resource benefit, and the implementation of prescribed fire and manual treatment projects to achieve protection and resource objectives. Alternative B includes strategies for managing natural ignitions to reduce hazardous fuels, restore fire in fire-adapted ecosystems, improve wildlife habitat, and restore native vegetation. All human-caused wildfires would be suppressed.

Alternative B is a response to the current high fuel loading and vegetation conditions in the monument and the need to reduce the risk of a recurrence of a catastrophic wildfire similar to the 1992 Rainbow Fire. High fuel loading in many areas of the monument is a result of the after-effects of the 2011 Devils Windstorm.

2.4.1 Strategic Wildfire Management Zoning and Treatment Units

Alternative B proposes to zone the monument into strategic wildfire management zones using the same wildfire management zoning designations that the U.S. Forest Service is using in the INF Draft Land Management Plan governing the forestlands that surround the monument (Appendix C, Figure C. 7 and Table 2.2).

General Wildfire Protection Zone. This area of the monument (shown in orange in Figure C. 7 in Appendix C) is at high risk from wildfire damage due to the concentration of visitors and facilities. The NPS proposes to use manual fuels treatments and/or prescribed fire to reduce fuels and lower the risk of wildfire damage. On a very limited basis, wildfire could be used to provide ecological benefits in this zone.

Wildfire Restoration Zone. The zoning proposed for the majority of the monument would be Wildfire Restoration Zone (shown in green). In this zone, the fire management priority is to promote more natural forest ecological structure and function while protecting isolated assets. In this zone, much of which is federally designed wilderness (green areas that are lightly hatched on Figure C. 7 in Appendix C), the response to wildfire would be commensurate with its potential risk, effects, and benefits. Wildfire for multiple objectives could be used to increase ecosystem resilience and resistance to climate change, air pollution, insect infestations, and high-severity wildfires. Prescribed fire would be used to reduce high fuel loading and restore natural fuel conditions. In some locations, manual treatments would focus on thinning of small-diameter trees and piling dead and downed woody debris prior to burning.

Wildfire Maintenance Zoning. In the future, portions of the monument would be rezoned from Wildfire Restoration Zone to Wildfire Maintenance Zone as restoration goals are met through prescribed burning or management of natural ignitions. A goal of Alternative B is to promote a fire regime that results in a forest structure that increases the resilience of the monument's forests to the effects of wildfire and other stressors. Where monitoring results find conditions approximating those of a more natural fire regime, areas of the monument would be rezoned as a "Wildfire Maintenance Zone," meaning the area would tolerate wildfire for multiple objectives as a primary management tool. Areas may be put on a recurring maintenance schedule for future prescribed fire and manual fuels treatments in the absence of opportunities for wildfire management for multiple objectives that mimic the natural fire return interval.

Table 2.2 compares the zoning goals and fire management strategies for the three zones and generally describes the values at risk in each zone.

Table 2.2. Summary of Proposed Strategic Wildfire Zones

Zone Name	Goal	Monument Resources at Risk	Wildfire Response Strategy	Fuels Management Strategy
P GENERAL WILDFIRE PROTECTION	Protect monument visitors and reduce the risk to natural and cultural resources from unwanted wildfire.	Majority of monument infrastructure, high visitor concentration, the access road, recreational resources, and natural and cultural resources.	Provide an aggressive initial suppression response to wildfire. Use wildfire on a limited basis to increase ecosystem resilience and provide ecological benefits when conditions allow.	Use manual treatment and/or prescribed fire to reduce hazardous fuel loads.

Zone Name	Goal	Monument Resources at Risk	Wildfire Response Strategy	Fuels Management Strategy
R WILDFIRE RESTORATION	Promote a fire regime that results in a forest structure that increases the resilience of the monument's forests to the effects of wildfire and other stressors.	Wilderness and non-wilderness forests, wildlife habitats, watersheds, riparian corridors, meadows, ecological processes, nationally significant trails, and cultural resources.	Suppress unwanted wildfire. Allow wildfires to spread under limited conditions which provide opportunities to increase ecosystem resilience and to provide ecological benefits.	Use manual treatments, combined with prescribed fire, to reduce fuel loads and restore a more natural fire regime, and for management of special resources, including Soda Springs and cultural resources.
M* WILDFIRE MAINTENANCE	Maintain ecosystem resilience and allow for the ecological benefits of wildfire.	Wilderness and non-wilderness forests, wildlife habitats, watersheds, riparian corridors, meadows, ecological processes, nationally significant trails, and cultural resources.	Suppress unwanted wildfire when conditions warrant. Use wildfire to maintain ecosystem resilience and provide ecological benefits when conditions allow.	Use manual treatment, combined with prescribed fire, where necessary to reduce risk of damage from unwanted wildfires and/or maintain a more natural fire regime.

***Note:** At present, no monument lands are proposed for inclusion in the "Wildfire Maintenance Zone." However, over the life of the FMP, the intent is that some monument lands currently in the "Wildfire Restoration Zone" would, following fire management treatments, transition to the "Wildfire Maintenance Zone" as ecological conditions in these areas come into conformance with more natural fire regimes.

2.4.1.1 Treatment Units

NPS staff developed treatment units for the monument's fire management program based on current forest conditions, past disturbance history (fire, windstorm, and fire exclusion), past fuels treatments, resource and safety values at risk, and forest restoration objectives. The proposed treatment units are a planning tool to address current fuels and resource conditions and consider priorities and treatment strategies across the monument. Data used to develop the treatment units were gathered from various sources including past reconnaissance, current aerial imagery, mapping of Rainbow Fire severity, 2011 Devils Windstorm impact distribution, vegetation mapping, fire effects monitoring plots, and other existing datasets. Boundaries for the treatment units were developed by identifying commonalities of forest condition, wilderness designation, fuel loading, and location of natural barriers and trail and road alignments. Treatment unit boundaries shown should be considered preliminary; more precise project boundaries would be drawn as the individual burn plans are developed. Burn units may be smaller than the treatment unit or overlap onto adjacent treatment units based on information gathered in the field for the specific burn plan.

Appendix C, Figure C. 7 shows the location of the 10 treatment units proposed under Alternative B. The General Wildfire Protection Zone, encompassing the non-wilderness area of the monument, is split into a northern and southern unit (Units 1 and 2) based primarily on the values of public safety and forest condition. The rest of the monument is zoned for Wildfire Restoration and is split into eight units which include both non-wilderness and wilderness. Proposed actions for each unit are described in Table 2-3, as are current conditions and treatment objectives. The fire management activities and priorities within each treatment unit may change as the FMP is reevaluated on an annual basis.

Units 1 and 2 have been previously treated. These units would require ongoing manual and prescribed fire treatments to maintain defensible space around monument structures and thin vegetation in the day use and campground areas. These two treatment units, which typically see the highest number of visitors, are high priority for fuels treatments including prescribed fire.

Treatment Unit 3 encompasses Soda Springs Meadow. The NPS is proposing to maintain current meadow extent and support persistence of meadow habitat for natural biodiversity. Low intensity prescribed fire may be used to limit the establishment of conifers at the meadow edges.

Treatment Units 4 and 6 are a high priority for treatment from a life/safety perspective. These units have not been previously treated to reduce fuels and both areas contain large accumulations of dead and downed trees from the 2011 windstorm. Unit 4 burned with moderate intensity during the 1992 Rainbow Fire while Unit 6 is unburned. Within and adjacent to Treatment Units 4 and 6 are areas where nearly all mature live trees (roughly 80% to 100%) were downed in the 2011 wind event. Treating Units 4 and 6 with prescribed fire

would provide an additional buffer of reduced fuels to help protect the developed area of the monument, the Reds Meadow Resort, the Reds Meadow Road, and trailheads from wildfire.

Treatment Unit 8 extends south of Unit 4 and burned with mostly low and moderate severity in the Rainbow Fire and experienced low to moderate impacts from the blowdown. There is a substantial amount of conifer regeneration in this area, some of which is in dense thickets. Prescribed fire would reduce fuels and improve the buffer along the boundary between the unit and INF while thinning some of the conifer recruitment. The large numbers of visitors that hike to Rainbow Falls through this unit increases the risk of a human-caused wildfire occurring.

Lower priority units include 5, 7, 9 and 10. Portions of Treatment Unit 5 burned with low to moderate intensity in 1992 Rainbow fire and experienced low to moderate blowdown impacts, while the southern end burned with high severity. Most of Treatment Unit 7 burned with high intensity in the 1992 Rainbow fire and is largely dominated by shrubs with little conifer regeneration. The NPS proposes to conduct research burns in Unit 7 to determine whether a low intensity prescribed fire could reduce fuels and shrub cover, and reduce the severity of an unwanted wildfire while promoting forest regeneration. The northern section of Treatment Unit 9 did not burn in the Rainbow fire but experienced severe impacts from the blowdown, while the southern portion burned with moderate intensity and experienced low to moderate blowdown impacts. The high concentrations of fuel from the blowdown could be reduced by treatments such as winter jackpotting (e.g. igniting concentrations of fuel when snow is on the ground). Treatment Unit 10 is the most remote in the monument and burned with moderate to high severity in the Rainbow fire, and experienced low to moderate blowdown impacts. There are large expanses of exposed rock in portions of Unit 10 that lower the overall fuel loading and function as a barrier to fire spread. Portions of Treatment Units 5, 7, 9, and 10 burned with such high severity during the Rainbow Fire that much of the area is dominated by shrubs with few scattered conifers. If research from prescribed fire application in Treatment Unit 7 is supportive, low intensity prescribed fire may be applied in these areas.

Proposed actions in each treatment area would be developed into specific burn plans or manual treatment plans prior to implementation by teams of subject matter experts, which could include, based on the specifics of the treatment area involved, fuels specialists, fire ecologists, fire cultural resource specialists, plant ecologists, foresters, wildlife biologists, and monument and forest management. The specific boundaries of burn units for the prescribed fire would be developed from the site reconnaissance and may be smaller than the treatment units depicted and may not specifically follow the boundaries of the generalized treatment units.

Table 2-3. Fire Management Objectives and Proposed Fire Management Activities, by Treatment Unit

Unit	Management Zone/ Ac.	Current Condition	Treatment Objective	Proposed Fire Management Activities
1	Protection Zone 22 acres	Primarily lodgepole pine (<i>Pinus contorta</i> spp. <i>murrayana</i>) forest. Developed visitor-services area. NPS administrative buildings and employee housing. Previously treated.	Hazard fuel reduction, Restore and maintain natural fire and overstory conditions, Maintain natural fire return interval.	Highest priority for maintenance of defensible space. Maintain with manual treatment and prescribed fire.
2	Protection Zone 33 acres	Primarily lodgepole pine, Jeffrey pine (<i>Pinus jeffreyi</i>), and red fir (<i>Abies magnifica</i>) forests. Some blowdown. Previously treated (manual and prescribed fire).	Hazard fuel reduction. Restore and maintain natural fuel and overstory conditions. Maintain natural fire return interval.	Maintain and treat with prescribed fire in approximately 10 years. Low- to moderate-intensity prescribed fire. Minimal manual treatment to support prescribed fire.
3	Restoration Zone 8 acres	Meadow and riparian	Reduce conifer establishment	Possible low-intensity prescribed fire.

Unit	Management Zone/ Ac.	Current Condition	Treatment Objective	Proposed Fire Management Activities
4	Restoration Zone 40 acres	Primarily lodgepole pine (<i>Pinus contorta</i> spp. <i>murrayana</i>), Jeffrey pine (<i>Pinus jeffreyi</i>), and red fir (<i>Abies magnifica</i>) forest Burned with low to moderate intensity in 1992 Rainbow fire Moderate to high blowdown impacts	Reduce fuel hazards to improve protection of developed areas. Restore and maintain natural fuel and overstory conditions. Maintain natural fire return interval.	Low- to moderate-intensity prescribed fire. Once restoration objectives are met, maintain conditions by prescribed fire.
5	Restoration Zone 137 acres	Primarily lodgepole pine (<i>Pinus contorta</i> spp. <i>murrayana</i>), Jeffrey pine (<i>Pinus jeffreyi</i>), and red fir (<i>Abies magnifica</i>) forest. Burned with low to moderate intensity in 1992 Rainbow fire. Low to moderate blowdown impacts.	Reduce fuel hazards to improve protection of developed areas. Restore and maintain natural fuel and overstory conditions. Maintain natural fire return interval.	Low- to moderate-intensity prescribed fire. Maintain conditions by prescribed fire. Once restoration objectives are met, maintain conditions by prescribed fire. Once restoration objectives are met, rezone to Wildfire Maintenance Zone. Wildfire for multiple objectives, as conditions allow.
6	Restoration Zone 26 acres	Primarily lodgepole pine (<i>Pinus contorta</i> spp. <i>murrayana</i>), Jeffrey pine (<i>Pinus jeffreyi</i>), and red fir (<i>Abies magnifica</i>) forest. Not burned in 1992 Rainbow fire. Extensive blowdown.	Reduce fuel hazards to improve protection of developed areas. Restore and maintain natural fuel and overstory conditions. Maintain natural fire return interval.	Low- to moderate-intensity prescribed fire to maintain conditions. Once restoration objectives are met, rezone to Wildfire Maintenance Zone. Wildfire for multiple objectives, as conditions allow.
7	Restoration Zone 40 acres	Former forested, converted to shrubland post-fire with some conifer regeneration. Burned with high intensity in 1992 Rainbow fire.	Restore and maintain natural fuel conditions and promote forest regeneration. Maintain natural fire return interval.	Possible low-intensity broadcast or research burns to reduce fuels and shrub cover and assess conifer response. If research supports, low- to moderate-intensity prescribed fire. Wildfire for multiple objectives, as conditions allow.
8	Restoration Zone 113 acres	Primarily Jeffrey pine (<i>Pinus jeffreyi</i>), and red fir (<i>Abies magnifica</i>) forest. Burned with high intensity in 1992 Rainbow fire. Low to moderate blowdown impacts. Generally good conifer regeneration. Has been largely type converted to postfire shrubland.	Restore and maintain natural fuel and overstory conditions. Maintain natural fire return interval.	Low to moderate intensity prescribed fire. Once restoration objectives are met, maintain conditions by prescribed fire.
9	Restoration Zone 125 acres	Burned with low to moderate intensity in 1992 Rainbow fire. Low to moderate blowdown impacts. Generally good conifer recruitment.	Restore and maintain natural fuel and overstory conditions.	Thinning and limbing, pile burning of cut/downed vegetation following by prescribed fire. Prescribed fire and wildfire for multiple objectives to maintain conditions once restored.
10	Restoration Zone 248 acres	Burned with low to moderate intensity in 1992 Rainbow fire except in extreme southwest corner, which was high severity. Generally good conifer recruitment.	Restore and maintain natural fuel and overstory conditions.	Thinning, limbing, pile burning, and broadcast burning to achieve restoration objectives. Prescribed fire and wildfire for multiple objectives to maintain conditions once restored.

Note: Treatment unit acreages are approximate and could be adjusted as the FMP is implemented.

2.4.2 Fire Suppression and Wildfire Managed for Multiple Objectives

Under Alternative B, all human-caused fires would be suppressed as in Alternative A. Naturally ignited wildfires would be suppressed whenever there is a threat to life, public safety, property, significant cultural

resources or if natural resource management objectives would not be met. INF fire crews would be the first responders to a wildfire in the monument, and the response determination would be based on the risk assessment of the initial responding crew in consultation with fire management specialists and the monument Superintendent.

In accordance with federal wildland fire management policy, which allows part of a fire to be suppressed (e.g., approaching a community) while allowing another flank to burn (e.g., approaching wilderness).under Alternative B, unplanned natural ignitions could be managed to accomplish specific resource management goals and objectives when appropriate conditions exist. Wildfire could be managed to reduce hazardous fuels, restore fire in fire-adapted ecosystems, improve wildlife habitat, and restore native vegetation. During the past century, the exclusion of fires in the monument has been so successful that when wildfires do occur, such as in 1992, fire severity is higher due to the accumulation of fuels. With higher severity, more mature trees are killed, preventing or largely suppressing forest regeneration and increasing damage to soil integrity, river water quality, wildlife diversity, and the public's recreational experience. Alternative B addresses the need to promote a fire regime that results in a forest structure that increases the resilience of the monument's forests to the effects of wildfire and other stressors, while at the same time, protecting visitors and facilities in the monument, in the adjacent National Forest System lands, and in the communities and resorts to the east.

The decision to manage a wildfire, or part of a fire, for multiple objectives is dependent on assessing several factors, including location, fire behavior, fuels, human values at risk, risk to firefighters, cost, time of year, current and predicted weather, local/regional/national fire activity, resource availability, and potential resource benefits. The NPS and other federal land management agencies with wildland fire responsibility use the Wildland Fire Decision Support System (WFDSS) process and analytic tools to guide and document wildfire management decisions. The WFDSS process will rely, in part, goals and objectives of the FMP. The WFDSS process includes; situational assessment, hazard and risk analysis, and documentation of approved implementation actions. Approval of the decision to manage a wildfire for other than suppression is the responsibility of the park superintendent and would be published in a WFDSS decision support document. Approval of each successive decision for managing the fire would be based on current approval requirement guidelines and thresholds as defined in the Interagency Standards for Fire and Fire Aviation Operations (NIFC 2018). When a wildfire is burning on NPS lands and adjoining jurisdictions, such as INF, a single interagency decision support document is be prepared with input from all jurisdictional agencies.

Upon deciding to manage an unplanned natural ignition for multiple objectives, the fire management staff would develop a monitoring and future containment plan for the wildfire, and ensure that the firefighting resources are in place for a successful outcome. National fire policy allows part of a fire to be suppressed (e.g., approaching a community) while allowing another flank to burn (e.g., approaching wilderness).

Suppression of fires resulting from natural ignitions is especially likely in the General Wildfire Protection Zone, where the majority of visitors may be located. INF fire crews would be the first responders to a wildfire in the monument, and the response determination would be based on the risk assessment of the initial responding crew in consultation with fire management specialists and the Superintendent.

While many natural ignitions remain small and go out on their own due to surrounding rock or accompanying moisture, it is possible that managed fires of larger size would leave the monument. In these cases, the NPS and the INF would decide jointly on management of a wildfire for multiple objectives that had the potential to burn from the monument into the INF (or vice versa).

Managing natural unplanned ignitions for multiple objectives would require monitoring, MIST, the placement of fire crews in the wilderness, the use of electronic communication and measuring devices, and the assignment of resource advisors to the incident management team to ensure that impacts to natural and cultural resources are avoided or minimized.

2.4.3 Manual Fuels Treatments

Under Alternative B, manual fuels treatments would be implemented as described in Section 2.2.3. Under Alternative B, manual fuels treatments would be permitted in the Wildfire Restoration Zone, which encompasses all areas designated as wilderness in the monument.

Several treatment units have large accumulations of dead and downed trees from the 2011 Devils Windstorm. Prior to introducing prescribed fire into these units, manual treatments would be used to buck up the accumulated logs and branches and pile the cut vegetation for winter burning.

2.4.4 Prescribed Fire

Alternative B would allow the reintroduction of low- to moderate-intensity fire as a disturbance process through understory prescribed burning to mimic the past fire regime and reduce the likelihood of high-intensity fires. It is anticipated that under Alternative B, less than 100 acres would be burned annually in the monument.

As areas are prescribed burned, monitoring would determine whether burn objectives are met as assess forest condition. As forest condition improves, some areas may be rezoned from Wildfire Restoration to Wildfire Maintenance. The NPS would investigate the effectiveness of prescribed fire on reducing conifer establishment at Soda Springs Meadow.

NPS staff would coordinate with the Great Basin Unified and San Joaquin Valley Air Pollution Control Districts to develop and provide Air Quality Advisories during wildfire and prescribed fire events to inform the public and employees about current and expected conditions and health concerns. NPS would work with the air districts during all prescribed fire and wildfire management for multiple objectives operations to minimize smoke impacts and ensure conformance with air quality regulations.

2.4.5 Pile Burning

Under Alternative B, pile burning would be implemented as described in Section 2.2.5. Pile burning would be allowed throughout the monument, including in wilderness. Pile burning may be used in the Wildfire Restoration Zone with an approved burn plan to reduce large accumulations of dead and downed fuels that could present control problems if ignited by a wildfire. Pile burning would be conducted when snow is on the ground, whenever feasible.

2.4.6 Resource Advisors

Under Alternative B, NPS would assign READs to an incident as dictated by values at risk, the READ guides, and WFDSS. The monument would host annual pre-season meetings with cooperators to identify areas and issues of concern. READs will be involved during and after wildfire and during prescribed burn planning as dictated by values at risk, to ensure that prescriptions and burn objectives do not conflict with objectives for the protection of sensitive vegetation, wildlife, and important elements of wildlife habitat.

2.4.7 Monitoring, Research, and Education

Under Alternative B, the NPS would continue the current monitoring program as described in Section 2.2.7. In addition, NPS may establish new monitoring plots in the treatment units prior to any fire management actions (See Goal 9 in Section 1.4). The NPS would focus on identifying information gaps that hamper science-based decision making and solicit fire research from universities to help fill these gaps. Research would be encouraged that investigates past and expected fire effects to better understand the effects of fire on potential climate change refugia. The NPS would investigate the effectiveness of fire treatments on reducing conifer establishment in meadows.

The NPS would develop and publish interpretive material regarding wildfire fire, prescribed fire, and fuels management activities for the public, the NPS workforce, and cooperating agencies.

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section analyzes both beneficial and adverse impacts that would result from implementing either alternative described in Chapter 2. It is organized by resource and provides a comparison between alternatives based on the issues identified for detailed analysis. This document addresses the direct and indirect potential environmental impacts from all aspects of the No Action Alternative and the Preferred Alternative, revision of the monument's FMP. Applicable cumulative impacts are described, and a brief discussion of the importance of impacts is provided.

For all analyses provided, it is assumed that the mitigation measures described in Section would be implemented, in accordance with the monument's revised FMP. These mitigation measures are intended to minimize adverse impacts to resources while achieving the objectives of the FMP.

3.1 CUMULATIVE IMPACT SCENARIO

In accordance with the NPS DO 12 NEPA Handbook, connected, similar, and cumulative actions are actions that result as a direct or indirect consequence of the alternatives and can be undertaken by federal, state, or local entities. Connected actions are closely related to the proposed action and should be analyzed in the same NEPA document. Similar actions are those that have similar geography, timing, purpose, or other similar features to the proposed action. There are no similar or connected actions associated with the proposed FMP revision. Cumulative actions are those actions that have additive, or cumulative, impacts on a particular resource. Cumulative actions may have occurred in the past, may be occurring in the present, or are reasonably foreseeable to take place in the future. This section summarizes cumulative actions that are considered, by resource, under Environmental Consequences. Table 3.1 provides a cross-reference and summary for the potential cumulative impacts expected to the resources analyzed in this EA from each of the cumulative actions listed below.

3.1.1 Land Management Plan for the Inyo National Forest

The INF encompasses approximately 2 million acres and its lands completely surround the monument. The INF just released its land management plan, or forest plan, as required by the National Forest Management Act. Forest plans are one of three levels of planning and decision-making guiding management of National Forest System lands. The first and broadest level of planning occurs at the national level and is the Forest Service Strategic Plan, a 5-year plan that allows public transparency of the INF's goals, objectives, and accomplishments. The second level of planning is at the administrative unit level and is the forest plan. The third level of planning is individual project plans and activities that conform to the forest plan, including wildland fire management. The 2018 Land Management Plan for the INF describes interagency collaboration on wildland fire:

Base fire management on an all lands risk-based approach in planning and decisionmaking that is responsive to the latest fire and social sciences and is adaptable to rapidly changing conditions, including climate change. Coordinate wildfire management with relevant State agencies and adjacent Federal agencies. Consider the net gains in benefits in the decisionmaking process.

3.1.2 INF Reds Meadow Road Repair and Improvement Project

The INF has jurisdiction over the 8.3-mile Reds Meadow Road, which provides the only access to the Devils Postpile National Monument entrance road and several INF campgrounds, day use parking areas, trailheads, a horse camp and equestrian facility, the Minaret Vista entrance station, and Reds Meadow

Resort and Pack Station. The INF partnered with Town of Mammoth Lakes and the Central Federal Lands Highway Division of the Federal Highway Administration to develop a grant proposal in 2017 for repair and rehabilitation of the deteriorating Reds Meadow Road. The NPS supports the need for road repair and improvements of the Reds Meadow Road on the INF and a request for request for collaboration to find solutions to the periods of vehicle congestion that compromise visitor safety and experience, when the mandatory shuttle bus is not running. Through comments on the EA for the project, the NPS recommended mitigations to minimize impacts on wildlife migration corridors and reduce impacts to air quality during construction. The Federal Lands Access Project grant proposal is prioritized for construction funding in 2022.

The project would provide much needed safety and sustainability improvements to the deteriorating INF road corridor and would include a plan and commitment for annual and cyclic road maintenance from the Town of Mammoth Lakes. The improvements will facilitate emergency response to the valley, allow for safe egress, and improve traffic safety. The project scope includes reconstruction and widening of the upper 2.5 miles to two lanes of traffic, repaving, and some slight realignments to the lower 5.8 miles of Reds Meadow Road. The project design includes retaining walls, slope stabilization, and drainage improvements.

3.1.3 INF Mammoth Ranger District Reds Meadow Hazardous Fuels Reduction Project

In concert with the project described in Section 3.1.2, the INF has developed a fuel reduction/forest health improvement project for 2,149 acres along Reds Meadow Road and to the north and east of the monument. If grant funding is secured, the project would be well underway prior to the start of the Reds Meadow Road Repair Project reducing fuel loading and the risk of catastrophic wildfire in the corridor prior to the road construction. The planning process is expected to be completed by the end of 2018; the NEPA decision should be available by early 2019. Implementation could begin as early as 2019 and extend for 5 or more years.

Actions proposed include thinning selected trees up to 30 inches in diameter at breast height and conifers established in meadows or aspen stands. Removal would concentrate on trees that are dead and dying from drought, insects, and/or pathogens. Larger, more vigorous, fire resistant trees would be retained. A combination of ground based mechanical equipment and hand crews would be used to accomplish the work. Helicopter logging or other aerial methods may be used on steeper slopes. Resulting timber from fuels treatments will be sold for fuel wood or saw logs, and residual slash and tree tops will be piled and burned, or chipped. Subsequent prescribed burning would further reduce fuel loads.

3.1.4 Interagency Planning for Visitor Use Management and Safety at Minaret Vista Access Station

The Minaret Vista Access Station is an entry way used to manage routine and emergency access on Reds Meadow Road. The Minaret Vista Access Station to Reds Meadow Road opened in 1979 when the mandatory shuttle bus system began. The NPS and INF have since worked together to ensure safe and efficient visitor access to Reds Meadow Valley. Reds Meadow Road provides the only private vehicle and shuttle access to the Valley and to Devils Postpile Road. Providing for sustainable operations is an ongoing challenge that the NPS and INF have collaborated on since its initiation, and future challenges need to be addressed in this planning process. The primary functions of the station are:

- Emergency coordination point for visitor information, access management and traffic control,
- Evacuation management during emergencies, including fires, winter storms, etc.,
- Road and traffic management during law enforcement and medical responses,
- Communication of observed road hazards and management of traffic during hazardous situations,

- Management of large and/or hazardous vehicles and substances,
- Public information on closures and fire safety, restrictions, activity, smoke/air quality advisories, and
- Access management during the mandatory shuttle season and when parking capacity is exceeded outside of the shuttle season.

From mid-June to Labor Day, visitation is managed by the operation of a mandatory shuttle bus to the monument from the Minaret Vista Access Station, allowing two to three times as many visitors to be accommodated in this very popular recreation area within the narrow river valley corridor. When the mandatory shuttle ceases operations after Labor Day, the monument's 65-space parking lot along the river can be exceeded by three to sevenfold the available spaces, compromising visitor safety and enjoyment. Visitors will start parking along Reds Meadow Road and at the Rainbow Falls Trailhead and Reds Meadow Pack Station. There are no feasible locations for additional paved lots, and development of additional parking was not supported by the public during the monument's general management planning process. Visitation to the Reds Meadow Valley continues to grow along with successful marketing by the Town of Mammoth Lakes.

In a letter of support for the Reds Meadow Road Repair project, the NPS requested collaboration from the partners to develop measures to address vehicle congestion (routine and emergency operations) that may require evacuation, or, when it may not be possible for people to exit the box canyon, a shelter-in-place protocol.

3.1.5 Interagency Public Safety Response Plan for Reds Meadow Valley and Devils Postpile National Monument

Given that the monument is surrounded by INF lands and accessed by a single road through the INF, planning for the protection of visitors to the Reds Meadow Valley in the event of a wildfire or other emergency must be an interagency effort and is, therefore, outside the scope of this FMP. The NPS, INF, and Mammoth Lakes Fire Department, along with other public safety organizations, will develop a public safety fire response plan for the monument that will address the feasibility of evacuation planning and identify areas of the monument which could be designated, improved and provisioned as an in-monument safety zone(s) in the event of an emergency as an alternative or supplement to evacuation. The partners have initiated discussions and further discussions will continue into 2019. This planning process will be developed in coordination with the Interagency Planning for Visitor Use Management and Safety at Minaret Vista Access Station described in Section 3.1.4.

3.1.6 Invasive and Non-Native Plants Program 2016–2020

The NPS is implementing a multi-year invasive plant management program for the control of several highly invasive species found in discrete populations within or just adjacent to the monument. Sixteen non-native species are known to occur in the monument, and three of these—bull thistle (*Cirsium vulgare*), woolly mullein (*Verbascum snyderii*) and cheatgrass (*Bromus tectorum*)—are considered invasive by the California Invasive Plant Council while the other species are considered non-native but not invasive. The program focuses on early detection and eradication to prevent the invasive species from becoming widespread, ecologically damaging, and expensive future problems. Program elements include prevention and early detection, inventory, prioritization, treatment, monitoring, research, education, and outreach.

Table 3.1. Summary of Potential for Cumulative Impacts Resulting from Project Comprising the Cumulative Scenario

Action Considered for Cumulative Impact Analysis:	Air Quality	Vegetation and Wetlands	Wildlife/Special-Status Species	Visitor Experience	Wilderness Character	Cultural Resources	Summary of Potential Cumulative Impacts
Land Management Plan for INF	Yes	Yes	Yes	Yes	Yes	Yes	This plan provides opportunities to work cooperatively to manage wildfire for resource benefits across boundaries and cooperate on fuel reduction efforts on a landscape scale. The wildland fire strategies are in conformance based on the stated goal from the FMP cited in the Section 1.4.
INF Reds Meadow Rd Repair & Improvement Project	Yes	Yes	Yes	Yes	Yes	No	Roadwork has the potential to affect localized air quality, vegetation (tree removal, ground clearing for retaining walls, road widening, wildlife corridors, visitor experience (delays short term, safety improvements long term).
INF Reds Meadow Hazardous Fuels Reduction Project	Yes	Yes	Yes	Yes	Yes	Yes	This project would have both short-term adverse impacts during disturbance and long-term benefits for forest resilience and resistance to wildfire.
Interagency Planning at the Minaret Vista Access Station	Not sig	No	No	Yes	Yes	No	Traffic and safety control would have long-term benefits for visitor experience by avoiding and reducing congestion and promoting shuttle use, as well as providing safe egress.
Interagency Public Safety Response Plan for Reds Meadow Valley & Devils Postpile National Monument	No	No	No	Yes	Yes	No	This response plan would not have a noticeable effect on the visitor experience, with the exception of bringing the issue of safety to the attention of the visitor, through interpretive information. The plan would also provide information on what to do in the event of an emergency, where to assemble, etc.
Invasive and Non-Native Plants Program	No	Yes	No	Yes	Yes	No	The program would provide benefits to plants, wildlife habitat, wilderness, and visitor experience. The program includes ample setbacks from wetlands and riparian areas for any needed herbicide treatment.

3.2 AIR QUALITY

3.2.1 Affected Environment

Overview

Two primary air quality issues could be influenced by the proposed FMP actions. First, the majority of the monument is within the Ansel Adams Wilderness which is a mandatory Class I area under the 1977 amendments to the Clean Air Act (CAA). This Class I designation grants the highest level of air quality protections for national wilderness areas and specific national parks. Second, the monument lies within Madera County, which is part of the San Joaquin Valley Air District (Air District). This Air District is designated as “non-attainment” for two criteria pollutants: ozone (O₃) and PM_{2.5}. “Non-attainment” means that air quality monitoring indicates emissions of these pollutants exceeding national and/or state standards. Both pollutants have public health and safety concerns and potential ecological consequences.

Class I Airshed

The 1977 amendments to the CAA established Class I, II, and III areas, where emissions of particulate matter, sulfur dioxide (SO₂), and nitrogen dioxide (NO₂) are to be restricted to control visibility impacts from haze and smog. Restrictions are most protective in Class I areas, which include national parks and

wilderness areas larger than 6,000 acres and 5,000 acres, respectively, that were in existence as of 1977. Class I designation is intended to prevent further degradation of the airshed from human-caused pollutants, such as those related to transportation, stationary industrial sources, and agricultural waste burning. Monument visibility can be impaired as a result of wind events, pollution from the San Joaquin Valley, and smoke from wildland fires (Burley et al. 2016).

Background levels of both O₃ and PM_{2.5} have policy-relevant significance, especially as they relate to current standards set for criteria pollutants. Background PM_{2.5} generated from natural source emissions in the southern Sierra Nevada Mountains, such as wind-blown dust and/or smoke from naturally ignited fires, is estimated at the relatively low level of $4.7 \pm 1.3 \mu\text{g m}^{-3}$ (Cisneros et al. 2014). Modeled background levels of O₃ for this region is estimated to be 30 to 60 parts per billion which approaches the federal and state standard of 70 parts per billion. These background levels support the importance of measuring ambient levels and tracking exceedances in and/or near the monument.

Criteria Pollutants

The primary objective of the CAA is to establish federal standards for various pollutants from stationary, mobile, and area sources, and to provide for the regulation of polluting emissions via State Implementation Plans (SIPs). As required by the CAA and its amendments, the U.S. Environmental Protection Agency (EPA) set National Ambient Air Quality Standards (NAAQS) for seven criteria pollutants considered harmful to public health and the environment. These include particulate matter less than 10 microns in size (PM₁₀), PM_{2.5}, O₃, carbon monoxide (CO), NO₂, SO₂, and lead (Pb). The State of California has added Ambient Air Quality Standards for four additional pollutants which include hydrogen sulfide, sulfates, vinyl chloride, and visibility reducing particles. Generally, California standards are more stringent than national standards but since the Air District is in non-attainment for federal standards, the focus of the analysis in this EA is focused on the federal NAAQS.

For NAAQS and State standards, refer to pages C-2 and C-3 of the Area Designations for State and National Ambient Air Quality Standards on the California Air Resource Board website: <https://www.arb.ca.gov/regact/2013/area13/area13appc.pdf>.

The goal of the CAA is to prevent significant deterioration in areas of the country where air quality meets or is better than the NAAQS, and to provide for improved air quality in areas that do not meet NAAQS (“non-attainment” areas). The monument is located in Madera County, which falls in the Air District. Using the more stringent State standards, the entire Air District is classified as non-attainment for PM₁₀, PM_{2.5} (moderate to serious), and O₃ (extreme). The Air District is classified as being in attainment for NO₂, SO₂, lead, and sulfates, and unclassified for hydrogen sulfide and visibility reducing particles. Madera County is unclassified for CO.

The CAA requires states to develop SIPs for the regulation of polluting emissions. Title 17 of the California Code of Regulations, Subchapter 2, provides smoke management guidelines to regulate emissions from prescribed and agricultural burning. Title 17 required the Air District to implement Best Available Control Measures (BACM) to comply with the NAAQS for PM₁₀. (In 2010, the Air District and California Air Resource Board subsequently identified PM_{2.5} as a greater concern.) To implement BACM, the Air District developed a smoke management program in 2002 as part of the California SIP. This includes the rules, policies, and procedures for the Air District to comply with Title 17 requirements. Appendix B of the Air District’s smoke management plan is Rule 4106 (developed in 2001), which has the purpose to permit, regulate, and coordinate the prescribed burning and hazard reduction burning while minimizing smoke impact on the public.

Beginning in 2004, local land managers and the Air District worked together to further refine the Air District’s smoke management plan and developed the *Unified Guidelines and Procedures for Smoke Management* (Unified Guidelines), which outlines the steps the NPS and other land managers must follow when submitting a smoke management plan to the Air District for approval through the Prescribed Fire

Information Reporting System (PFIRS). Prescribed burning in both alternatives and managing wildfires for multiple objectives proposed in the preferred alternative, Alternative B, would be required to adhere to the Unified Guidelines to minimize adverse smoke impact to public health. Furthermore, as part of the PFIRS data entry, NPS staff are required to identify the primary approving air district for the proposed prescribed fire site and any secondary air district that could also be affected by smoke dispersal. In the case of the monument, the Great Basin Unified Air Pollution Control District, which includes the Town of Mammoth Lakes, would be identified as the secondary air district.

Though located in an air district with extreme O₃ non-attainment, the monument is generally considered an area with low pollution, compared with the western slope of the central Sierra Nevada site (Cisneros et al. 2010). Air quality conditions at the monument are excellent for the majority of the year (NPS 2017b). When air quality is impaired, it frequently can be attributed to either the transport of pollutants from the San Joaquin Valley or smoke from nearby wildland fires.

Of all the criteria pollutants identified by the EPA and California Air Resource Board, the two primary concerns in the monument's airshed are elevated levels of ambient O₃, which can be damaging to living cells, and particulate matter, which can impact human health and visibility. PM_{2.5} in particular, as opposed to PM₁₀, poses higher health risks for humans and can cause or exacerbate respiratory problems.

Ozone

O₃ can be of particular concern to NPS managers as it can have a negative impact on plants and human health when present in high concentrations. Occasionally, ground-level O₃ levels may be unhealthy to monument visitors and staff (Bytnerowicz et al. 2013). Ground-level O₃ values are low at night, but daytime concentrations can exceed both state and federal air pollution standards for several days during the summer (NPS 2017b).

O₃ production from fires is a complex interaction. Fires can both suppress local O₃ (due to increased emission of nitrogen oxides [NO_x] and decreased solar radiation) and also enhance O₃ levels (due to increases of NO_x and volatile organic compounds [VOC], which are O₃ precursors) (Burley et al. 2016). O₃ is a secondary emission formed in the atmosphere by photochemical transformation of primary emissions such as NO_x and VOCs. NO_x and VOCs are both produced by wildland fires. The amount of NO_x and VOCs generated is dependent on type of fuel, moisture content, and combustion temperature (Sandberg et al. 2002).

Despite being located in an air district with extreme O₃ non-attainment, the monument, compared with the western slope of the central Sierra Nevada, is generally considered a low pollution site (Cisneros et al. 2010). O₃ levels at the monument are in "good" condition for the majority of the year (NPS 2017b).

Particulate Matter

Particulate matter (specifically PM_{2.5}) can reach unhealthy levels for days or weeks in the summer when local or regional wildland fire smoke blows into the area. High concentrations of particulate matter create haze, diminish views, degrade visitor experiences, and potentially impact human health.

Higher elevation sites in the Sierra Nevada show a pattern of high particulate matter in the summer, compared with the winter. Episodes of high concentrations of fine particles at the monument are typically short term and due to smoke from wildland fires. Health advisories are usually issued during these periods. When smoke is not present, data show that ambient conditions have very low concentrations of PM_{2.5}.

Air Quality Related Values

Air quality related values (AQRVs) are used by federal land managers to determine the impact of pollution to federal lands. An AQRV is a resource that may be adversely affected by a change in air quality. These include visibility, plants, animals, soils, water quality, cultural and historic structures, and visitor health affected by air pollution. Visibility, both day and night, is a sensitive AQRV affected by air

pollution. In accordance with the CAA, the NPS as the Federal Land Manager of the monument, has an affirmative responsibility for the protection of its AQRVs.

3.2.2 Environmental Consequences

3.2.2.1 Alternative A: (No Action Alternative) Full Suppression with Limited Fuel Treatments

Impacts from Wildfire Suppression

Under the No Action Alternative, fire management activities would include wildfire suppression of all unplanned ignitions throughout the monument and allow for prescribed fire (pile burning and broadcast burning) and manual fuels treatments in the non-wilderness, northeast corner (approximately 15% or 113 acres). Suppression tactics would generally limit fire spread to the smallest possible size. Based on the monument's fire history, unplanned ignitions occur within its boundary less than once per year on average. Past fires have been suppressed at less than 1 acre during initial attack. Some lightning strike fires in the Buttresses have required INF suppression. Other than the 1992 Rainbow Fire, which escaped initial attack and burned through much of the monument, these ignitions would not contribute significant particulate matter to the local or regional airshed.

Equipment used for suppression may include motorized equipment, such as chainsaws and water pumps, to construct and hold firelines, and aircraft to monitoring fire activity or aerial delivery of water. The amount of air emission generated by this equipment would be very limited, compared with the emission generated by a wildfire. Equipment and aircraft emissions would be adverse and short term in duration. Air emission would be dissipated by wind.

Suppressing all unplanned wildfires under Alternative A would produce lower emissions over the short term but would fail to address current and continued excess fuel loading throughout the monument. In the long term, suppression could increase the potential for more high-intensity, longer-duration wildfires, which could produce substantial adverse air quality impacts to both the San Joaquin Valley and the Great Basin.

Impacts from Prescribed Fire, Pile Burning, and Manual Fuels Treatments

All wildland fires (prescribed and wildfire) generate smoke and ash, which contribute to regional haze and produce a number of criteria pollutants regulated by the CAA. Criteria pollutants specific to fire include PM10, PM2.5, CO, NO2, and SO2. Wildfires also produce a number of other toxic pollutants, including but not limited to VOCs, acrolein, benzene, and formaldehyde, but in much lower concentrations than particulate matter and CO (Ammann 2001; California Air Resources Board 2003).

Under Alternative A, prescribed fire would only be conducted in the non-wilderness portion of the monument limiting the number of acres eligible to be burned to 113. Prescribed burns in one area could occur once every 15 years to mimic the average fire return interval of 14.2 to 18.3 years (Caprio et al. 2006). Contributions of smoke, O3, and particulate matter impacting air quality would be primarily from prescribed fire, which could include broadcast burns and pile burns. Smoke impacts would depend on burn size, fuel, and weather conditions at the time of ignition, and an individual's sensitivity to smoke.

Pile burning would normally occurs only in the winter months after the monument access road is closed. Burning at this time of year eliminates smoke impacts to visitors and staff. Piled material undergoes a curing process in order to be dry enough to burn in winter months. This dried material burns relatively clean with lower emissions. Pile burns in the monument are small in nature; emissions from pile burning would have a short-term local impact, but would not contribute to regional particulate matter levels.

All broadcast burns would be subject to rigorous planning and approval from the NPS and the Air District. This increases the likelihood that appropriate conditions would exist during implementation for smoke and particulate matter to be well dispersed. Burn windows are carefully evaluated by NPS staff

and Air District meteorologists to consider smoke impacts into the nearby Town of Mammoth Lakes, the primary smoke sensitive receptor. As a result, regional effects on air quality from broadcast burning would normally be away from the community, which reduces the chance of smoke impacts to public health. The duration of any impact would correspond to the duration of the prescribed burn.

The primary purpose of prescribed fire is to restore conditions that support the natural fire cycles in the forest ecosystems. Both the NPS and the Air District recognize that while the increased use of prescribed fire may generate short-term particulate impacts, the long-term particulate emission levels would be expected to be lower than those from a large wildfire.

Smoke emissions from prescribed burning under either alternative would be managed as outlined in the Unified Guidelines to minimize adverse smoke impacts to public health. All monument prescribed burns are required to have a companion Smoke Management Plan entered into the PFIRS and approved by the Air District. As part of the PFIRS data entry, NPS staff would also notify the Great Basin Unified Air Pollution Control District, which includes the Town of Mammoth Lakes.

Adhering to the Unified Guidelines, the monument would work with the two air districts to identify optimal windows for good smoke dispersion. Prior to the prescribed burn, the NPS would participate in statewide calls between land managers proposing prescribed fires and all representative of the California air districts to coordinate activities state-wide and regionally. Participation in the daily calls will continue throughout the period before and during the prescribed fire or managed wildfire. NWCG policy within the Interagency Prescribed Fire Planning and Implementation Procedures Guide (PMS 484; NWCG 2017a) further requires land agencies to take special consideration to address smoke when in a federal NAAQS non-attainment area to comply with SIPs.

In accordance with the Unified Guidelines, the monument is required to report prescribed burn emissions of PM₁₀, PM_{2.5}, NO_x, SO₂, VOC, and CO to the Air District immediately post-burn. This is done on a standardized emissions reporting form developed by the Air District. Previous monument burning based on 63.13 tons per acre of available fuel resulted in 0.69 tons of PM_{2.5} being emitted into the atmosphere for each acre burned. This is an indicator of the past and not necessarily a predictor of the future PM_{2.5} emissions.

Due to the monument's small size and the presence of unburnable features (rock and water), the acreage that could burn in a wildfire (suppressed or managed) is limited. The proposed level of prescribed burning under both alternatives is also relatively low, and there would be some years of no burning and other years with more acres subject to prescribed fire. Anticipated O₃ contribution from both proposed alternatives is very small and neither would produce regionally significant amounts.

Under Alternative A, manual treatments entail using chainsaws to thin smaller trees around structures, developments, or areas impacted by the 2011 Devils Windstorm. Exhaust emissions from the use of chainsaws, pumps, and/or aircraft would be intermittent, temporary, and only last for the duration of the action or project. While these emissions may include criteria pollutants such as PM_{2.5}, they would not affect local or regional air quality.

Prescribed burning and manual treatments could also improve the success of wildfire suppression operations, thereby resulting in beneficial impacts to regional air quality due to the reduction of fuel loading.

Cumulative Impacts

Cumulative impacts to air quality could occur if monument prescribed burning coincides with either high wildfire activity locally or regionally, or if prescribed burning is happening concurrently on the neighboring INF. The duration of the cumulative impact would correspond to the duration of all fire events.

Under the No Action Alternative, prescribed fire activities would be limited to 113 non-wilderness acres. The cumulative effects of the No Action Alternative on air quality would be sporadic and short term. Adhering to the requirements of the Unified Guidelines, NWCG prescribed fire policy, and the prescribed fire plan template would further mitigate smoke impacts. This includes coordinating ignitions with the INF and the Air District to avoid overloading the airshed.

3.2.2.2 *Alternative B: Targeted Suppression with Limited Managed Wildfire and Monument-wide Fuels Treatments (Preferred Alternative)*

As in Alternative A, under Alternative B, the NPS proposes the suppression of all human-caused wildfires and unwanted naturally caused wildfires and the use of wildfires managed for multiple objectives, prescribed fire and manual treatments to reduce fuels.

There are two primary differences between the two alternatives. Under Alternative B, 1) the use of fuels treatments, both manual and prescribed fire, would be expanded into the remaining 85% of the monument (the 687-acre wilderness portion), and 2) the management of naturally ignited wildfires for multiple objectives would be allowed.

Impacts from Wildfire Suppression and Wildfire for Multiple Objectives

Managing wildfires for multiple objectives would allow some lightning-ignited wildfires to burn under appropriate conditions rather than fully suppressing them. This conforms to current federal and NPS wildland fire management policy, which allows the full range of strategic and tactical options to be available and considered in the response to every wildland fire. Human-caused fires would continue to be suppressed under this alternative.

Based on the monument's fire history, unplanned ignitions occur within its boundary less than once per year on average. Due to the monument's position within the greater Reds Meadow Valley and relatively small size, managing wildfires for multiple objectives would most likely occur in conjunction with and with the support of the INF fire management program.

Under Alternative B, the entire monument would be subject to wildfire for multiple objectives. This includes all acres within the wildfire restoration zone and under rare circumstances could include the general wildfire protection zone in the northeast corner of the monument (see Appendix C, Figure C. 7)

Managing wildfires for multiple objectives has the potential to contribute more particulate matter and reduce visibility to local and regional airsheds due to the lack of control over weather and atmospheric conditions for the duration of the event. Given that wildfire management for multiple objectives does not have a predetermined size as opposed to prescribed burns, these ignitions are unpredictable both when they occur and in terms of how long they last. The amount of smoke and the duration of the event could be expected to be longer. Visibility would possibly be compromised, depending on the size of the wildfire and atmospheric conditions, thereby adversely impacting of the monument's AQRVs. Given the monument's relative small size, a large fire such as the 1992 Rainbow Fire could burn through its entire area in one event and in a short time period. As with prescribed fire, the impact of emissions on visitors and the local community would depend on fire size, fuel and weather conditions, and an individual's sensitivity to smoke.

Under Alternative B, one of the primary purposes of managing natural wildfires is to restore (and ultimately maintain) conditions that support the natural fire cycles in the forest ecosystems. While this would generate short-term particulate and visibility impacts, this action allows natural processes to perpetuate within the monument. In the long term, particulate emission levels would be expected to drop as a result of a healthier and more resilient forest ecosystem. The likelihood of large wildfire occurrence would be reduced through proactive fire and fuels management.

Impacts from Prescribed Fire, Pile Burning, and Manual Fuels Treatments

Under Alternative B, the use of prescribed fire could occur anywhere within the monument, including in the 687-acre wilderness. Prescribed fire activities would be managed in the same manner as the No Action Alternative. Burn size would be relatively small, at approximately 200 acres annually, based on the current proposed treatment unit sizes. Treatments could occur annually, but it is estimated that the same treatment area would be treated approximately once every 15 years to mimic the average fire return interval within the monument. Impacts to air quality from prescribed burning would be sporadic and short term. Adhering to the requirements of the Unified Guidelines, NWCG prescribed fire policy, and the prescribed fire plan template, as well as coordinating with the INF, would further mitigate smoke impacts.

Because prescribed fires can be scheduled, monument staff can coordinate with the INF and the Air District to avoid an airshed smoke overload. Personnel also work with the Air District to take advantage of favorable weather atmospheric conditions for dispersing smoke to avoid impacting sensitive areas. Prescribed burning gives a certain amount of control over the distribution and timing of emissions to minimize exceeding PM_{2.5} standards. It can be expected that increased prescribed burning would reduce fuel loading and ultimately result in lower emissions from future wildfires.

Impacts from pile burning and manual fuels treatments are similar to Alternative A due to the relatively small size of the anticipated treatment areas.

Cumulative Impacts

The current INF FMP allows for the management of natural wildfires for multiple objectives. Smoke from managed fires, either originating on the monument or the INF, could have an adverse cumulative effect on visitors and Mammoth Lakes in the local and regional airsheds.

Under Alternative B, prescribed fire activities would be allowed within 800 acres in the monument. The cumulative effects of the Alternative B to air quality would be sporadic and short term. Adhering to the requirements of the Unified Guidelines, NWCG prescribed fire policy, and the prescribed fire plan template would further mitigate smoke impacts. This includes coordinating ignitions with the INF and the Air District to avoid overloading the airshed.

As with prescribed burning, managing natural wildfires for multiple objectives requires constant communication and coordination with the Air District. As an example, the Air District works with land agencies during these events to find favorable weather windows for holding operations when they include backfiring. During times of high wildfire activity, the Air District may discourage managing new fires and would encourage full suppression. Emissions of PM₁₀, PM_{2.5}, NO_x, SO₂, VOC, and CO from managed fires are reported (on suppression fires they are not). Smoke impacts to Mammoth Lakes are monitored, advisories are given, and if air quality approaches unhealthy levels regionally, fires may be suppressed.

3.2.2.3 Conclusion

In summary, under Alternative B the potential to manage select wildfires for multiple objectives could generate higher levels of emissions than the suppression-only strategy under Alternative A. Prescribed burning under Alternative B could occur over all 800 acres, compared with the 113 acres of non-wilderness in the monument. Under Alternative A, the 113 acres could be treated approximately once every 15 years. Selecting Alternative B would result in a larger area also being treated once every 15 years; however, burning could occur more frequently due to the individual treatment sizes being less than 200 acres. This would result in higher levels of emissions. Alternative A would not effectively reduce fuel loading and would not reduce the high-severity wildfire risk. Therefore, the risk of a high emission event such as the 1992 Rainbow Fire would increase over time. The potential to manage wildfire for multiple objectives, increase prescribed burning and pile burning under Alternative B could result in more air emissions initially, especially during winter months. Ultimately, the goal of Alternative B is to restore a more natural fire regime and reduce the risk of a high-severity wildfire. It is expected that this

strategy would reduce emissions over time. These activities would result in either minimal impacts (suppression, manual treatments, and pile burning) or short-term adverse impacts (broadcast burning) to air quality corresponding to the duration of the event.

3.3 VEGETATION, WETLANDS, AND SENSITIVE PLANT SPECIES

3.3.1 Affected Environment

General Vegetation

The monument lies within the California Floristic Province, which encompasses most of the state of California to the west of the drier Great Basin and Desert biogeographic regions. The province is designated as a global biodiversity hotspot by Conservation International due to its high rates of endemism and the relatively threatened state of remaining habitats. The monument also lies within the Sierra Nevada ecoregion, as defined by the *Jepson Manual for Higher Plants of California* (Hickman 1993).

Fire regimes are closely tied to variation in climate, as well as local vegetation and fuel conditions. Fire history studies based on tree-ring studies of fire-scarred trees in the Sierra Nevada show that most plant communities existed with some influence from fire. A fire history study for the monument reported average (or mean) site fire return intervals from 14.2 to 18.3 years (Caprio 2006; Caprio et al. 2006). Single intervals ranged from 3 (lower elevations) to 30 years (higher elevations). This variation appears to be the result of topographic barriers to fire spread up the San Joaquin River drainage and changes in vegetation and fuel with elevation and aspect (NPS 2017b).

In 1992, the Rainbow Fire burned approximately 84% of the monument. The fire burned with very high intensity and resulted in high-severity patches hundreds of hectares in size with complete tree mortality; roughly a quarter of the monument's area burned with high severity. In these patches, lack of seed sources restricts the regeneration of young trees. Studies of the fire effects within the high-severity portions of the 1992 burn perimeter demonstrate that wildfire, as a process, is currently outside its historic range for fire effects (NPS 2017b).

Though small, the monument is diverse enough in topography and geology to support a number of different plant communities. Species characteristic of both the wetter western and drier eastern slopes are present in the monument due, in part, to its proximity to the lowest pass on the Sierra Divide. The dominant mixed coniferous forest gives way to a riparian zone along the Middle Fork of the San Joaquin River, and in other places to small meadows, seeps, and sag ponds, while shrublands dominate the southern end of the monument. Based on vascular plant inventories (Arnett and Haultain 2005; Arnett et al. 2014; Alphandary 2016; Buhler 2018), 385 vascular plant and 41 non-vascular plant species occur in the monument, representing 62 families and 205 distinct genera.

Mixed conifer forest covers approximately 70% of the monument, composed primarily of red fir (*Abies magnifica*), white fir (*Abies concolor*), and lodgepole pine (*Pinus contorta* spp. *murrayana*) (Appendix C, Figure C. 9). Jeffrey pine (*Pinus jeffreyi*) is moderately widespread in patches at lower elevations, while on higher north-facing slopes scattered mountain hemlock (*Tsuga mertensiana*) and western white pine (*Pinus monticola*) occur. Western juniper (*Juniperus occidentalis*) is present but uncommon, restricted to rocky, warm dry sites protected from fire (Keeler-Wolf et al. 2012).

The structure and composition of the coniferous forests in the monument have been strongly influenced by two major disturbance events in the past 25 years: the August 1992 Rainbow Fire (Caprio et al. 2006; Caprio and Webster 2006) and the 2011 extreme wind event and forest blowdown (NPS 2017b). In some portions of the monument, up to 80% of the trees were blown down during the 2011 Devils Windstorm.

Broadleaved trees, including mountain alder (*Alnus incana*), black cottonwood (*Populus tricho-carpa* ssp. *balsamifera*), and quaking aspen (*Populus tremuloides*), form approximately 3% of the monument while

shrub-dominated ecosystems with whitethorn ceanothus (*Ceanothus cordulatus*), huckleberry oak (*Quercus vaccinifolia*), and manzanita (*Arctostaphylos* spp.) cover 17.5% of the monument.

Sensitive Plant Species

Three sensitive plants also occur in the monument (Table 3.2). All three species are considered threatened in other parts of their ranges, but not within or around the monument. Of the 86 sites surveyed for plants in 2001, one site contained Bolander’s woodreed (*Cinna bolanderi*), and two sites each contained short-leaved hulsea (*Hulsea brevifolia*) and cutleaf monkeyflower (*Mimulus laciniatus*), all within designated wilderness (Arnett and Haultain 2005). To date, no plant species found within the monument are listed as threatened or endangered under the state or federal endangered species acts (NPS 2015).

Table 3.2. Sensitive Plants within the Monument

Common Name	Scientific Name	CNPS Rank*	Habitat Requirements	Distribution in the Monument**
Bolander’s woodreed	<i>Cinna bolanderi</i>	1B.2	Wetland/riparian	One collection in a spring-fed drainage surrounded by Jeffrey pine/red fir forest.
Short-leaved hulsea	<i>Hulsea brevifolia</i>	1B.2	Red fir forest	Five collections; common in volcanic substrates in the post-fire region of the monument.
Cutleaf monkeyflower	<i>Mimulus laciniatus</i>	4.3	Red fir forest, yellow pine forest, wetland/riparian	Two collections from seeps on granite.

*California Native Plant Society Rank: 1B.2 = rare, threatened, or endangered in California and elsewhere; moderately threatened in California, 4.3 = endemic; limited distribution in California; not very threatened in California

**Source: Dulen (2012)

Non-native Plant Species

Sixteen non-native species are known to occur in the monument, and three of these—bull thistle, woolly mullein, and cheatgrass—are considered invasive by the California Invasive Plant Council while the other species are considered non-native but not invasive. Based on treatment history over the past 15 years, and annual assessments that have shown a reduction in the spatial distribution and size of populations, the trend is improving (Buhler 2018). Cheatgrass occurs within a 25-acre area in a remote location in the monument and remains a concern. Large-scale cheatgrass invasion has been shown to alter fire regimes by shortening the intervals between fires, and consequently, fire can facilitate cheatgrass dominance on some sites (Balch et al. 2013).

Wetlands and Riparian Areas

Wetlands and riparian areas, many of which are scrub/shrub wetlands, comprise 7.5% (60 of the 800 acres) of land area in the monument, largely because of the influence of the San Joaquin River. The monument’s wet meadows support very high biotic diversity per acre of habitat. Many Sierra Nevada wetlands and meadows exhibit augmented productivity and high-species diversity and provide important physical and chemical functions such as nutrient uptake, flood attenuation, sediment trapping, and habitat and food for wildlife. As the climate changes, deep valleys and river canyons where cold air pooling occurs (strong inversion where cold air is trapped and conditions are cooler and moister, compared with higher elevations) may ameliorate warming and provide climate change refugia. Other important attributes of climate change refugia include a perennial water supply, rich biodiversity, and tree canopy cover, all of which are present in Soda Springs Meadow (NPS 2017b).

Away from the San Joaquin River, small springs support islands of hydrophytic flora scattered on otherwise xeric pumice-soil slopes; these wetland plant communities and the persistent high groundwater

and surface water provide forage, cover, and moisture for resident fauna and migratory animals traveling between upland habitats. There are also mineral springs, relatively rare in the Sierra Nevada, located in and around the monument, characterized by high conductivity, bubbling, red and white staining of the rocks due to high iron content, and algal blooms. The primary example at the monument is the carbonated mineral springs located in Soda Springs Meadow (NPS 2017b).

A spatially comprehensive assessment of all wetlands within the monument conducted in 2006 found most wetlands to be at or above the desired condition using the California Rapid Assessment Method for Wetlands and Riparian Areas (Denn and Shorrock 2009). Based on the assessment, 37% of the monument's wetland acres represent desired condition, 63% are in good condition, and less than 0.5% are in poor condition (NPS 2017b).

3.3.2 Environmental Consequences

3.3.2.1 *Alternative A: (No Action Alternative) Full Suppression with Limited Fuel Treatments*

Under the No Action Alternative, all naturally ignited and human-caused wildfires would be suppressed throughout the monument.

Suppression actions such as fireline clearing of understory vegetation, the limbing of trees and shrubs, and the felling of snags and live trees would have direct adverse impacts on vegetation. Some trampling of vegetation could occur during suppression activities from firefighters and equipment, and vehicles could crush or remove vegetation in localized areas; however, this impact would be minimized with implementation of MIST measure FMP-4, which prohibits the use of motorized vehicles or heavy equipment off of established roads without Superintendent authorization. Removal of vegetation along firelines would result in the direct loss of individual plants; however, impacts are not expected to rise to population-level effects due to the relatively limited area involved with firelines. These impacts are expected to last only for the duration of the wildfire or for one to two growing seasons post-fire in meadows and shrublands. If many trees are cut during suppression actions, impacts to forest structure and species composition could be longer term. Post-fire rehabilitation and fire suppression repair would also reduce the potential for soil erosion which would encourage vegetation recovery after suppression activities (see MIST measure VEG-1, Appendix D).

Suppression actions could also contribute to the spread of invasive non-native species through transport on firefighting equipment. MIST measures VEG-2, VEG-3, and VEG-4, as described in Appendix D, would be implemented to minimize this threat. Suppression activities could also have adverse impacts on sensitive plants and their habitat; however, the location of these populations are mapped and would be available to incident management teams which could direct suppression actions to avoid these areas wherever possible. These impacts would be less than the impacts from a high-intensity wildfire. Fire management activities in wetlands or riparian areas could occur but would be limited to during 1) emergency actions needed to manage a wildfire or 2) short-term disturbances within wetlands that would be necessary to implement fire management activities intended to restore the wetland; both would require Superintendent approval (see FMP-8, Appendix D).

Retardant use would not be permitted in the monument without express approval from the Superintendent or designee to protect human life or high-value resources (see MIST measure FMP-3, Appendix D). Vegetation that has been covered by retardant drops may suffer from leaf burn; however, these impacts would be short term, as plants typically recover within one to two months (U.S. Forest Service 2007). Studies indicate the possibility of phytotoxic effects to individual plants of more sensitive species at the application rates typically used, but generate no expectation of widespread or enduring impacts (U.S. Forest Service 2017). Retardant application can also facilitate the establishment and spread of non-native species, including cheatgrass (Marshall et al. 2016). According to MIST measure FMP-3 (see Appendix D), no retardant would be released within a 300-foot buffer zone surrounding wetlands, the San Joaquin

River, Reds Creek and Boundary Creek, the cliffs surrounding Rainbow Falls or the Postpile formation and other areas identified by the Superintendent to minimize impacts to wetlands and riparian areas from retardant use. In addition, MIST measure FMP-10 states that fire chemical use within the floodplain, wetlands, and other sensitive areas must adhere to the *Interagency Policy for Aerial and Ground Delivery of Wildland Fire Chemicals Near Waterways and Other Avoidance Areas* as described in Chapter 12 of the *Interagency Standards for Fire and Fire Aviation Operations* (U.S. Department of the Interior and U.S. Department of Agriculture 2018) or future revised version.

Impacts from Prescribed Fire and Pile Burning

Under the No Action Alternative, prescribed fire and pile burning could only be conducted on the 113 acres of the monument that are not designated as wilderness. A low- to moderate-intensity prescribed fire would result in short-term loss of individuals and communities of plants in herbaceous plant communities and shrublands and in the forest understory; however, fire-adapted tree species would remain intact. Prescribed fire would promote the growth of native grasses and forbs, by increasing seed production, germination, and establishment through increased cycling of plant nutrients. The duration and degree of beneficial impacts would be influenced by the frequency of prescribed fires, the number of acres burned during each cycle, and the vegetation types burned. Occupied sensitive plant habitat and wetlands would generally be avoided, but adverse impacts could occur if a prescribed fire were to spread beyond the boundary of the planned burn and affect desirable vegetation, especially those species not fire adapted or resilient to disturbance. According to MIST measure FMP-5, fireline construction within wetlands would be avoided for prescribed burns. Prescribed fire could also promote the spread of exotic annual grasses such as cheatgrass, and other invasive species and contribute to the spread of invasive non-native species through transport on firefighting apparatuses and machinery. MIST measures VEG-2, VEG-3, and VEG-4, as described in Appendix D, would be implemented to minimize this threat.

In the mixed-conifer forests of the California Sierra Nevada, prescribed fire is widely used to reduce fuels and shift future stand composition from shade-tolerant species to more fire-resistant pines, such as Jeffrey pine, that were historically more abundant (Zald et al. 2008). A moderate-intensity prescribed burn that kills trees, which is beneficial in terms of reducing stem density, would result in longer-term impacts to forests. Higher-intensity prescribed burns that create openings in the canopy would allow for forest regeneration and improve wildlife habitat. The use of prescribed fire would result in long-term benefits as a more open overstory and a perennial herbaceous understory would develop on most sites. Over time, more pronounced increases in species richness, diversity, and resiliency would occur, with a tendency toward fire-tolerant plant species across the affected landscape.

Since prescribed burning reduces fuel buildup, there would be fewer fuels to support a high-intensity fire, making wildfire suppression more easily attainable with fewer damaging suppression tactics required. The likelihood of direct consumption of organic matter is reduced in lower-intensity fires (Keeley et al. 2009). Mitigation measures such as rehabilitation of firelines and other ground disturbance, and strict prescription windows employed in prescribed burn planning, mean that broadcast burning is designed to be lower in intensity than wildfire. This promotes the survival of diverse species and seedbeds (Zald et al. 2008). Impacts on vegetation are therefore short term and adverse during the prescribed burn, but beneficial following the first growing season post-fire.

Pile burning of fuels from fuels treatment projects could result in impacts to grassland species in the direct vicinity of the pile due to burning, trampling and disturbance during pile construction and ignition. If piles are large and burn under high severity, some temporary soil impacts may occur beneath the pile. For example, surface and subsurface heating may alter soil chemistry, organic composition, deplete the soil seed bank, which could delay reestablishment of grass and shrubs species (Knapp et al. 2009). Invasive species may invade disturbed areas, particularly where reestablishment is delayed. Pile burning is most the efficient way to reduce the excess fuels accumulated from the 2011 blowdown in relatively remote locations where off-hauling or chipping is not possible. According to MIST measure FMP-14

(see Appendix D), READ would be involved during prescribed burn planning to ensure that prescriptions and burn objectives do not conflict with objectives for the protection of sensitive vegetation, thereby minimizing or avoiding impacts to these resources.

Under this alternative, the beneficial impacts of prescribed fire and pile burning activities would not occur in the majority of the monument (i.e., 687 acres of wilderness). Hazardous fuel loadings would be retained in wilderness and continue to accumulate. If a wildfire ignition occurs under these conditions, there is the potential that it would consume large areas of standing native vegetation (particularly native species that are susceptible to fire), remove seed banks, damage soils and hydrological processes, and create large areas of exposed soil, making the areas vulnerable to increased invasive plant establishment. A lack of prescribed fire use in wilderness areas under this alternative could preclude any beneficial impacts to vegetation that may result from the addition of ash, organic matter, and nutrients to the soil. Fire-adapted ecosystems would not be maintained and/or restored and could cause a decline in vegetation health, vigor and resiliency, species composition, and overall plant diversity. Impacts to plant communities could be adverse and long term.

Impacts from Manual Fuels Treatments

Manual fuels treatments would be used to cut, clear, or prune herbaceous and woody vegetation within 113 acres of non-wilderness as described in Chapter 2, Section 2.2.3. Manual fuels treatments would not occur in wetlands or sensitive plant habitat; therefore, manual treatments would not impact these vegetation communities. Manual treatment impacts would be limited to smaller, localized areas. Manual treatments, by thinning denser forested stands, promotes the growth of desirable species through modifying plant species composition and increasing plant species diversity in both the forest overstory and understory, thereby improving ecological function and resiliency of the existing forest ecosystem. Monument resource specialists would be involved during manual fuels treatment planning to ensure that treatments do not conflict with objectives for the protection of sensitive plant populations thereby minimizing impacts to these species. Although manual treatments could result in the loss of individual plants in the short term, the wider impacts to the plant population and community composition would be long term and beneficial, due to beneficial impacts on nutrient cycling, plant productivity, reduced invasive species cover, and improved resilience to unplanned ignitions.

Cumulative Impacts

The geographic extent for the analysis of cumulative impacts on vegetation is the Reds Meadow Valley. The temporal scope of cumulative impacts on vegetation is the duration of the FMP or up to 25 years when considering the long-term impacts from fire management activities and the historical fire cycle. As described in Section 3.1 the actions that have the potential to affect vegetation, sensitive plants, and wetlands are the revision of the INF Land Management Plan, the Reds Meadow Hazardous Fuels Reduction Project, the Reds Meadow Road project, and the Devils Postpile Invasive and Non-Native Plants Program.

The revision of the INF Land Management Plan includes coordination with the monument across boundaries to strategically manage fire and protect resources and offers more opportunities to use natural features and additional roads/trails to conduct operations. While adverse impacts from wildfire across boundaries are difficult to assess due the variable nature of fire and the large size (1.9 million acres) of the INF, when combined with fire management activities under the No Action Alternative, these actions would primarily result in long-term beneficial effects on plant communities. The INF Mammoth Ranger District Reds Meadows Hazardous Fuels Reduction project includes vegetation removal to reduce the threat of wildfire within the INF. This project would incrementally contribute to short-term, adverse effects on vegetation, when combined with fire management activities under Alternative A, but the project would not result in long-term ecosystem-wide cumulative adverse effects. The Invasive and Non-Native Plants Programs is intended to restore more natural conditions to vegetation communities within the monument. When combined with fire management activities under Alternative A that are expected to

result in long-term benefits through improved ecosystem functioning and improved resilience to wildfire across a broader area, the long-term cumulative effects would be beneficial to vegetative communities within the monument, including wetlands and sensitive plant species.

Impacts from the No Action Alternative, plus impacts from the past, present, and reasonably foreseeable future actions described above, would result in short-term adverse and long-term beneficial cumulative impacts to vegetation. The incremental impacts of the No Action Alternative would contribute slightly to, but would not substantially change, the vegetation impacts that are already occurring within the monument.

3.3.2.2 *Alternative B: Targeted Suppression with Limited Managed Wildfire and Monument-wide Fuels Treatments (Preferred Alternative)*

Impacts from Wildfire Suppression and Management of Natural Ignitions

The Preferred Alternative would allow for wildfire and fuels management throughout the monument to reduce hazardous fuels, restore fire in fire-adapted ecosystems, improve wildlife habitat, restore native vegetation, and improve forest resilience to fire. The Preferred Alternative includes the suppression of unwanted wildfires, including all human-caused fires and the subsequent impacts from suppression activities (e.g., fireline construction and chemical retardant use) as described above under Alternative A.

The primary difference between the No Action Alternative and the Preferred Alternative is the use of wildland fire for multiple objectives, which would allow the monument to manage unplanned ignitions when conditions allow for the fire to burn without immediate suppression. Therefore, it is likely for more acres of vegetation to be impacted by fire management activities under Alternative B than Alternative A. Impacts to vegetative communities, including sensitive plants and wetlands, would be the same as described under Alternative A for fire suppression activities, with both adverse and beneficial impacts from fire suppression activities potentially occurring on fewer acres under the Preferred Alternative because wildfire for multiple objectives would be allowed under the appropriate conditions.

Direct impacts to vegetation would occur as a result of wildfire managed for multiple objectives, though much of the monument's vegetation cover has adapted to fire-prone communities. Wildfire would have varying effects on vegetation, depending on fuel loads, fire intensity, and plant community composition. The use of wildland fire for multiple objectives would enhance the cycle of nutrients by releasing nutrients bound in dead plant material, making them available for new plant growth. Fire also encourages new growth of many plant species, creates openings in canopies, reduces dense stands of smaller diameter trees and alters plant community composition. The effects on grasslands, shrublands, and understory vegetation would be short term, while the effects on forests would be longer term, with some sites exhibiting delayed mortality (Caprio and Webster 2006). For example, following the 1992 Rainbow Fire, at sites that experienced moderate-severity fires, there was a substantial decline in tree density, particularly white fir and red fir; however, these species also showed good regeneration. On sites that experienced high-severity fire, Jeffrey pine regeneration was more pronounced. Only lodgepole pine survived at the sites experiencing a low-severity burn (Caprio and Webster 2006).

Without proactive fire and fuels management, wetlands are more vulnerable to catastrophic wildfire. The Preferred Alternative, which includes the management of wildland fire for multiple objectives, would limit fire management activities in areas of the monument where wetlands occur. Direct disturbance within wetlands would be avoided to the extent possible with the exception of 1) emergency actions needed to manage a wildfire, or 2) short-term disturbances within wetlands that would be necessary to implement fire management activities intended to restore the wetland. BMPs and other conditions specifically identified in the NPS Procedural Manual 77-1, Appendix 2, will be followed, as well as MIST measure FMP-8, described in Appendix D.

According to MIST measure FMP-14 (see Appendix D), a READ would be involved during and after wildfire to ensure that burn objectives do not conflict with objectives for the protection of sensitive plant populations and their habitat, thereby minimizing impacts to these resources. Overall, perpetuating a more natural fire regime would have long-term, beneficial effects on vegetation and sensitive plant populations.

Impacts from Prescribed Fire and Pile Burning

Under this alternative, prescribed fire and pile burning would be allowed throughout the monument, and used primarily in the Wildfire Restoration Zone to reduce fuel loads and restore a more natural fire regime. Short-term adverse impacts to vegetation, sensitive plants, and wetlands from prescribed fire and pile burning would be similar to those described under the No Action Alternative but would occur across the monument.

Under the Preferred Alternative, the NPS would consider research burns to assess the effects of low-intensity prescribed burning to reduce fuels, shrub cover, and forest regeneration. The goal of this research burn is to better understand of the effects of prescribed fire in areas that were forested prior to the 1992 fire and are now dominated by shrubs, and the potential of reducing the severity of subsequent fires. For example, reducing fuels and shrub cover in these areas could reduce the risk of another high-severity fire that could kill the remaining trees (those that were not killed in the Rainbow Fire) as well as the few conifers that have established post-fire.

Because knowledge of the success of this treatment and the impacts of burning upper montane meadows/wetlands above 7,500 feet is limited, any prescribed burns would be experimental, limited in extent and associated with research.

Prescribed fire and pile burning would result in long-term beneficial impacts to vegetation wetlands and sensitive plant habitat, as described under Alternative A, through maintaining ecological function and native species (Webster and Halpern 2010). Compared with the No Action Alternative, more acres of vegetation would benefit from these treatments in the long term under the Preferred Alternative.

Impacts from Manual Fuels Treatments

Short-term adverse impacts to vegetation from manual fuels treatments would be similar to those described under the No Action Alternative; however, manual treatments would occur over a larger area under the Preferred Alternative in preparation for more prescribed burns and continued treatment of blowdown areas. Wetlands and sensitive plant populations would be avoided. Manual fuels treatments, combined with prescribed fire, would result in long-term beneficial impacts to plant communities, as described under Alternative A. Compared with the No Action Alternative, more acres of vegetation would benefit from these treatments in the long term under the Preferred Alternative.

Cumulative Impacts

The geographic and temporal scope and the same range of actions addressed in the cumulative impacts analysis for vegetation are the same for the Preferred Alternative as for the No Action Alternative. Cumulative impacts of the Preferred Alternative would be the similar to those for the No Action Alternative, with increased long-term beneficial impacts resulting from increased planned management actions occurring within the wilderness portion of the monument. The Preferred Alternative would contribute to short-term adverse impacts to vegetation when added to past, present, and reasonably foreseeable actions, but would provide short- and long-term beneficial impacts through improved ecosystem functioning and a return to a more natural fire regime.

3.3.2.3 Conclusion

The effects on vegetation, sensitive plants, and wetlands as a result of suppression activities, prescribed fire, and manual fuels treatments would be the similar under both alternatives. However, these effects would occur across a larger area under the Preferred Alternative, and fire management activities and

treatments could have a longer duration, which would result in a greater contribution to fuel reduction and improved forest resilience to wildfire over the life of the FMP. Under the No Action Alternative, all unplanned ignitions would be suppressed, and wildfire for multiple objectives would not be employed. This has the potential for long-term adverse impacts to vegetation and sensitive plant populations as it would prevent the return of a more natural fire regime and more resilient ecosystem. Under the Preferred Alternative, the impact of managing wildfire for multiple objectives would result in short-term adverse impacts and substantial long-term beneficial impacts to plant communities.

3.4 WILDLIFE AND SPECIAL-STATUS SPECIES

3.4.1 Affected Environment

General Wildlife

The variety of habitats at the monument supports a diverse set of animal communities. In addition, the close proximity of relatively low mountain passes—Mammoth Pass and Minaret Vista—contributes to local biodiversity by providing migration corridors between surrounding habitats. One hundred seventy vertebrate species are confirmed or expected to occur within the monument. These include 43 mammal species (including bats), 114 bird species, seven reptiles, two amphibians, and four fish (non-native) (NPS 2017b).

Invertebrate inventory efforts at the monument are estimated to be only about 15% complete; these surveys recorded 94 taxa sampled from the river (Schroeter and Harrington 1995), 29 taxa from flooded portions of meadows, and 77 terrestrial taxa from non-inundated portions of meadows (Holmquist and Schmidt-Gengenbach 2005).

Based on all surveys (Patton and Chow 2015; Werner 2004) and observations, 23 mammal species (excluding bats) are documented as “present,” two as “probably present,” and one as “unconfirmed.” Recent surveys in nearby Yosemite National Park show that the distributions of several small-mammal species have changed, with some expanding their ranges or moving up in elevation, while others have shown range contractions or moved down. Potential drivers for the range shifts include habitat change due to altered fire regimes, or warmer, drier conditions due to climate change (Moritz et al. 2008; Moritz et al. 2011). The greatest concern is for high-elevation species whose distributions have retracted upward. If the observed trends persist, these species may disappear as they reach the uppermost elevations in the Sierra and have nowhere left to go (NPS 2017b).

The north-south axis of the Upper Middle Fork of the San Joaquin River and the surrounding steep topography provides a narrow sky window that provides shading in daytime and at times contains a cold air pool that keeps nighttime temperatures lower than surrounding higher altitudes. These lower minimum temperatures further influence distribution of flora and fauna (NPS 2015). These areas are being studied as potential climate change refugia sites within the monument.

A bat inventory conducted in 2001 and 2004 documented 10 bat species, three of which are special status, in the monument (Pierson and Rainey 2009). An additional three species are likely to occur but were not positively identified during the inventory. Based on the limited data available, the current condition of bat species within the monument is fair to good (Kuhn and Whittaker 2014). Regionally, the most significant threat to bats is habitat loss, but drought and its effect on emergent aquatic insects, which play a major role in bat diet, is also a concern (NPS 2017b).

A variety of bird inventory, monitoring, and assessment projects has provided information about numbers of bird species in the monument (Heath 2007; Siegel and Wilkerson 2004; Steel et al. 2012a, 2012b). Including both formal and unofficial surveys, the total number of species detected within the monument is at least 114. Twenty bird species documented in or near the monument are listed on one or more sensitive species lists. The Sierra Nevada Network bird monitoring project was initiated in 2011 (Siegel et al. 2010)

and conducts annual point counts at the monument, thus providing data to assess species richness and density over time. Information from a combination of bird inventory and monitoring projects in the monument and regional assessments suggests that species richness is well within the range of what would be expected for the habitat types and size of the monument (NPS 2017b).

Previous short-term monitoring of birds at the monument (2002–2006) showed some species in decline and others increasing, but overall bird densities increased over this time frame (Heath 2007; Kuhn and Whittaker 2014). Regional Breeding Bird Surveys show larger numbers of species declining. Seventeen of the species noted as declining at the regional level occur at Devils Postpile National Monument (Kuhn and Whittaker 2014). While the bird community condition was rated as fair to good (Kuhn and Whittaker 2014), numerous stressors affect birds across the region as well as in wintering grounds for migrating birds. There is cause for concern about the abundance of some bird species, and their current status is uncertain due to limited information on population trends (NPS 2017b).

Special-Status Species

The Federal Endangered Species Act (ESA) prohibits harm to any species of fauna or flora listed by the U.S. Fish and Wildlife Service as being either threatened or endangered. Such harm includes not only direct injury or mortality, but also disrupting the habitat on which these species depend. There are five threatened, endangered, or candidate species listed under the Endangered Species Act for the FMP planning area: Sierra Nevada bighorn sheep (*Ovis canadensis sierra*), North American wolverine (*Gulo gulo luscus*) (proposed threatened), the Sierra Nevada yellow-legged frog (*Rana sierrae*) (endangered), Yosemite toad (*Anaxyrus canorus*) (threatened), and Owens tui chub (*Gila bicolor* ssp. *snyderii*) (endangered). There is no designated critical habitat for any of these species in the monument.

Only one of the listed species, a single male Yosemite toad, has been observed in the planning area in the last 40 years and no other individuals have been observed during surveys subsequent to this one 2013 sighting. The monument is not within proposed critical habitat for the Yosemite toad. The NPS has completed informal consultation with the U.S. Fish and Wildlife Service on the potential for FMP actions to affect the Yosemite toad (NPS 2018).

3.4.2 Environmental Consequences

3.4.2.1 *Alternative A: (No Action Alternative) Full Suppression with Limited Fuel Treatments*

Impacts from Wildfire Suppression

General Wildlife

Under the No Action Alternative, all wildfires would be suppressed. During fire suppression activities, mammals may be disturbed by firefighters, use of mechanical equipment, and water applications. The duration of this disturbance would be limited to the duration of fire management activities. Adverse effects on individuals are expected to be short term and not rise to population-level impacts. With the exception of three rare bat species, most mammals occurring in the monument are considered common and widespread throughout the region, and many are adapted to developed areas and human disturbance. Suppression activities have the potential to remove suitable bat roost trees, which would result in short-term adverse effects on rare bat species in the monument.

During fire suppression activities, birds may be temporarily displaced by disturbance resulting from firefighters, use of mechanical equipment, and water applications. Nestling or fledgling birds may be lost through direct mortality during wildfire and suppression activities, but this threat would be mitigated with implementation of MIST measure WLDF-1 (see Appendix D). Adult birds easily can escape disturbance and fire through flight. The duration of impacts would be limited to the duration of fire management

activities. Permanent adverse effects on populations would not be expected to occur as a result of wildfire suppression.

During fire suppression activities, reptile and amphibian species may be temporarily displaced by disturbance resulting from firefighters, use of mechanical equipment, and water applications. Suppression activities may result in trampling and crushing of individuals. The duration of these effects would be limited to the duration of fire management activities. Additional impacts from suppression activities to amphibians, fish, and aquatic invertebrates include the inadvertent application of chemical retardants near waterways, the extraction of water during periods of low flow/water levels, and the spread of species and disease through the movement of water between sources. However, FMP-3 states that no fire chemical use will be released within a 300-foot buffer zone surrounding wetlands, the San Joaquin River, Reds Creek and Boundary Creek, the cliffs surrounding Rainbow Falls, or the Postpile formation and other areas identified by the Superintendent and adhere to the Interagency Policy for Aerial and Ground Delivery of Wildland Fire Chemicals Near Waterways and Other Avoidance Areas as described in Chapter 12 of the *Interagency Standards for Fire and Fire Aviation Operations* (U.S. Department of the Interior and U.S. Department of Agriculture 2018) or future revised version. Therefore, with implementation of MIST measures FMP-3 and FMP-8, which are designed to protect aquatic habitats, fire suppression activities are not expected to result in long-term effects on fish and other aquatic species.

The suppression of all wildfires could result in the buildup of fuel loads within the monument, which could lead to high-severity fire(s). In this case, the loss of snags and/or large trees could result in a long-term loss of habitat for nesting birds, squirrels, and other mammals. Severe fire and heavy fuel and slash buildup in riparian areas are predisposing factors for direct fish kills resulting from fire (Rinne and Jacoby 2005). A small stream with neighboring high fuel loads and high-severity fire is most likely to experience immediate aquatic species mortality primarily due to an increase in water temperature. Among the potential indirect impacts of high-severity wildfire are increased sedimentation and reduced availability of woody debris, all of which would temporarily adversely impact aquatic species. Therefore, the suppression of all wildfire within the monument could result in long-term adverse impacts to wildlife.

Special-Status Species

Suppression activities are not expected to have a direct impact on individual Yosemite toads since there are no occupied breeding meadows within 0.78 mile (i.e., maximum dispersal distance) of the boundary, but there is potential to remove or disturb suitable over-wintering habitat within the monument (NPS 2018). With implementation of mitigation measures and BMPs designed to protect the Yosemite toad and wetland habitats (see Appendix D), these impacts would be minimized.

Impacts from Prescribed Fire and Pile Burning

General Wildlife

Under the No Action Alternative, a prescribed fire could only be conducted on the 113 acres of the monument that are not designated as wilderness. The temporary effects to mammals as a result of prescribed fire would be similar to those from wildfire (e.g., displacement). However, prescribed fire provides varied habitat structure suiting a diverse wildlife assemblage and providing benefits to many species over the long term. Some species may utilize the vegetation within the prescribed fire treatment area for cover; therefore, prescribed fire could have adverse impacts for species utilizing this habitat. It is expected that such species would be able to utilize other suitable habitat in adjacent areas. Mitigation actions to minimize the severity of prescribed fire (e.g., development of site-specific prescribed burn plans and involvement of resource specialists in fire management activities) would limit adverse impacts to mammals to the short term.

Prescribed fire and pile burning have the potential to directly affect bats via heat, smoke, and CO. In addition, bats can be indirectly affected via habitat and prey base modifications. Prescribed burns can improve habitat quality bats via creation of snags, reduction in understory and midstory clutter and

creation of open flyways, and potentially an increase in prey base (Perry 2011). Not all units would be treated at one time, so most displaced bats would be able to find other habitat during treatment activities. Bat habitat could be improved through the use of fire, and BMPs would be implemented to minimize adverse impacts to bat habitat, thus while there could be some short-term adverse effects on bats during the fire activities, the long-term impacts would be beneficial.

Effects on birds as a result of prescribed fire are similar to those from wildfire. Potential impacts to nesting birds would be mitigated with implementation of MIST measure WLDF-1 (see Appendix D). Adult birds easily can escape disturbance and fire through flight. Some bird species would benefit in the long term from improved habitat created through the use of prescribed fire, e.g., the stimulation of growth and seed production of food plants for birds and other wildlife (Knapp et al. 2009). Some bird species may utilize the vegetation within the prescribed fire treatment for cover; therefore, prescribed fire could have adverse impacts for species utilizing that habitat. However, these species would be able to utilize other habitat in adjacent areas.

The varied habitat structure created through prescribed fire would suit a diverse wildlife assemblage and provide benefits to many bird species. Due to BMPs to minimize the severity of prescribed fire, including the development of site-specific prescribed burn plans and the involvement of monument specialists in fire management activities, adverse impacts to bird species would be short term. In addition, not all units would be treated at one time, so most displaced birds would be able to find other habitat during treatment activities.

Reptiles and amphibians have species-specific adaptations that allow them to avoid impacts from fire, including burrowing and selection of wetter habitats. Low-intensity fire may reduce soil moisture content through elimination of leaf litter and increase in light penetrating the soil surface (Barnes and Van Lear 1998 as cited in Floyd et al. 2002). Reductions in litter mass, depth, and moisture may result in a decrease in some herpetofaunal species (e.g., terrestrial salamanders) as they depend on these habitat features for respiration and foraging (Ash 1995 as cited in Floyd et al. 2002). Prescribed fire would be managed to create a mosaic of habitat benefiting many reptile and amphibian species over the long term. Due to BMPs to minimize the severity of prescribed fire (e.g., development of site-specific prescribed burn plans and involvement of resource specialists in fire management activities), adverse impacts to amphibians and reptiles would be short term, and beneficial effects would be short and long term.

Prescribed burning is not expected to be a threat to fish-bearing streams. Consideration of fish-bearing streams would be taken when planning prescribed burns and during implementation of prescribed fires care would be taken to avoid streams and rivers. Fish and aquatic habitats could be adversely affected due to small amounts of short-term sedimentation from ash from prescribed burning. With implementation of mitigation measures and BMPs designed to protect aquatic habitats (see Appendix D) and minimize the severity of prescribed fire, adverse impacts to fish and other aquatic species are expected to be short term if they occur.

Under the No Action Alternative, the beneficial impacts of prescribed fire and pile burning activities would not occur in the majority of the monument (i.e., designated wilderness). A lack of prescribed fire use in wilderness areas could preclude any beneficial impacts to wildlife habitat that may result from the addition of ash, organic matter, and nutrients to the soil. Fire-adapted ecosystems would not be maintained and/or restored and could cause a decline in vegetation health, vigor and resiliency, species composition, and overall plant diversity, resulting in potential long-term adverse impacts to wildlife habitat.

Special-Status Species

Wetland areas that have breeding habitat elements for the Yosemite toad would not be deliberately burned and if fire entry was expected, surveys for Yosemite toads would be completed thereby minimizing impacts to the Yosemite toad and its suitable breeding habitat from prescribed fire. Some rodent burrows

where toads often disperse/overwinter may also be affected, primarily during the ignition and mop-up phases when firefighters are walking through the unit. The potential exists for firefighters to step on the openings of burrows and cause partial cave-ins. Burrow openings may also be obstructed by fine ash or other debris during and after the burning operation. The loss of forest debris or rodent burrows from prescribed burning is not expected to adversely affect Yosemite toads because suitable breeding habitat appears to be more of a limiting factor for toads than upland dispersal/overwintering habitat (NPS 2018).

Impacts from Manual Fuels Treatments

General Wildlife

Manual fuels treatments would only occur within 113 acres of non-wilderness under the No Action Alternative. Manual treatments may cause noise or disturbance, temporarily displacing wildlife. However, displacement is expected to be minimal and short term. Vegetation management through manual treatment is discrete and targeted. In most cases, animals displaced from habitat could utilize adjacent habitats or undisturbed habitats elsewhere in the monument. If young are present (e.g., in nests), they may be lost directly during manual treatment; however, implementation of MIST measure WLDF-1 (see Appendix D) would reduce this threat. Manual fuels treatments have potential to result in removal of suitable bat roost trees, which would adversely impact bat species in the short term; however, this impact would be minimized with implementation of WLDF-2 (see Appendix D).

With implementation of mitigation measures and BMPs designed to protect aquatic habitats (see Appendix D), manual treatments are not expected to result in direct adverse effects on fish and other aquatic species. Removal of vegetative cover may cause a decrease in habitat quality due to increased water temperatures, increased suspended sediment, and decreased dissolved oxygen, which could cause displacement of individuals. However, displacement of individuals is expected to be temporary. Severe fire and heavy fuel and slash buildup in riparian areas are predisposing factors for direct fish kills resulting from fire (Rinne and Jacoby 2005); therefore, fuels treatments would result in a long-term beneficial impact to fish.

Special-Status Species

Potential effects on Yosemite toads from manual fuels treatments include the loss of habitat elements that could provide over-wintering cover or suitable breeding habitat. With implementation of mitigation measures and BMPs designed to protect the Yosemite toad and wetlands (see Appendix D), these impacts would be minimized.

Cumulative Impacts

The geographic extent for the analysis of cumulative impacts on wildlife and special-status species is the monument boundary and the adjacent INF. The temporal scope of cumulative impacts on wildlife is the duration of the impacts, which would coincide with the duration of prescribed burn or manual treatment activities, a period of several days when considering direct impacts to wildlife; with long-term impacts for a period of 25 years or more when considering habitat changes from fire management activities, particularly in slow growing vegetation communities. Section 3.1 outlines the past, present, and reasonably foreseeable future actions that may contribute to cumulative impacts to resources analyzed in this EA. Many of these actions could impact wildlife and special-status species at the monument.

Forest management actions proposed under the INF Forest Plan revision could cause short-term adverse impacts to wildlife and special-status species due to disturbance from planned treatments, including manual and mechanical thinning and prescribed fire. Long-term beneficial impacts from the INF Forest Plan revision would include restored native wildlife habitat and ecological functioning. Road improvements and hazardous fuel reduction occurring on Reds Meadow Road would cause localized disturbance to wildlife and wildlife habitat that would last for the duration of the construction activity and thinning treatments, which could last for 5 or more years, and for several growing seasons following

treatment until habitat is restored. The treatments would reduce the risk of catastrophic wildfire, providing long-term benefits for wildlife and special-status species. Vegetation management undertaken as part of the Invasive and Non-Native Plants Program may result in some short-term adverse impacts to wildlife associated with equipment noise and the presence of workers during planned vegetation management actions, but in the long term, these actions would improve ecological functioning in the monument and improve vegetation health and vigor, thereby improving overall habitat quality. Improvements to the habitat would provide beneficial impacts to wildlife and special-status species for many years to decades. Overall, these actions would contribute short-term and long-term impacts, which would be both adverse and beneficial to wildlife and special-status species.

Birds, bats (in certain life history stages), and adult mammals are capable of escaping disturbances and can occupy adjacent habitat until habitat is restored. However, cumulative impacts to wildlife could occur under Alternative A. This could occur if wildfire and/or fire management activities occur simultaneously with other fire management activities or other actions within the monument or in the adjacent INF. Such circumstances could compound the effects of temporary displacement on wildlife species by rendering habitats to which disturbed wildlife otherwise could escape also temporarily unsuitable. This could result in additional expenditure of energy and increased breeding and foraging competition. However, surviving individuals would be expected to repopulate disturbed areas over time. Species in less mobile life stages (juvenile or nestling) and less mobile species (small mammals, amphibians, and reptiles) could be cumulatively impacted through direct injury or mortality if they are experiencing similar effects from simultaneous activities. Prescribed fires carried out by the monument would avoid sensitive resources, including wetlands and the Yosemite toad, thereby not contributing to adverse cumulative effects on such resources.

Impacts from the No Action Alternative plus impacts from the past, present, and reasonably foreseeable future actions described above would result in short- and long-term adverse and beneficial cumulative impacts to wildlife and special-status species. The incremental impacts of the No Action Alternative would contribute slightly to, but would not substantially change, the impacts that are already occurring within the analysis area.

3.4.2.2 *Alternative B: Targeted Suppression with Limited Managed Wildfire and Monument-wide Fuels Treatments (Preferred Alternative)*

Impacts from Wildfire Suppression and Management of Natural Ignitions

General Wildlife

Impacts to wildlife from wildfire suppression under the Preferred Alternative would be similar to those described under the No Action Alternative. As conditions allow, wildfire could be managed for multiple objectives within the Wildfire Restoration Zone. In this case, mammals, when mobile, can typically escape the heat and smoke of wildfire. Juveniles or litters may be killed by fire, but breeding adults likely would survive and reproduce in the same year or in subsequent years, depending on the species and season. Some individuals of smaller species may not be able to escape fire. Volant mammals (bats) and adult birds are often capable of escaping fire through flight (hibernating bats may be able but to a lesser extent) (Perry 2011). Nestling or fledgling birds may be lost through direct mortality during these managed events, especially during the bird nesting season, but this threat would be greatly reduced with implementation of MIST measure WLDF-1 (see Appendix D), which states that fire management actions will normally be scheduled for August 1 through April 30 to avoid disturbance to nesting birds in conformance with the Migratory Bird Treaty Act unless a nesting bird survey is conducted by a qualified surveyor within 3 days prior to project initiation. If nesting activity is noted within the project area, the NPS biologist will determine if the project should be delayed until nesting is completed or if portions of the work site can be excluded and buffered from disturbance.

Reptiles and amphibians have species-specific adaptations that allow them to avoid impacts from fire, including burrowing and selection of wetter habitats less prone to wildfire; therefore, adverse impacts are expected to be minimal. Under the Preferred Alternative, the monument could manage unplanned ignitions when conditions allow for the fire to burn without immediate suppression. Therefore, it is possible for more acres to be impacted by fire management activities under the Preferred Alternative, compared with the No Action Alternative. In the long term, beneficial impacts to reptiles and amphibians are expected in the form of habitat enhancement.

The use of wildland fire for multiple objectives could have adverse effects on fish and aquatic species and their habitat. Fires can result in immediate fish mortality. Increased suspended sediment loads from rain events over areas covered in ash could temporarily degrade the water quality of fish and aquatic species habitat. The majority of the fires would burn themselves out in moist streamside areas, providing a natural buffer strip that would filter out products of erosion before they entered the stream. In addition, pumice soils which cover the monument are not highly erosive. Long-term benefits to fish and other aquatic species would occur due to the prevention of large-scale, severe wildfires.

Impacts to all wildlife may include the loss of cover and potential foraging habitat and temporary displacement of individuals (Perry 2011). However, animals could utilize neighboring unburned areas during fire and likely would repopulate burned areas once fire ceased. New growth in burned areas can provide increased forage quality and availability. Overall, effects on wildlife as a result of wildfire are expected to be short term, as fire-suppression activities would be implemented to contain and extinguish the fire. The duration of impacts would be limited to the duration of fire management activities.

Permanent adverse effects on populations would not be expected to occur when using wildland fire for multiple objectives, and short-term adverse effects would be reduced with implementation of MIST measures WLDF-1 and WLDF-2.

Special-Status Species

Potential effects on Yosemite toads include the loss of habitat elements that could provide over-wintering cover such as downed logs and rodent burrows. Fire could also impact wet meadows or suitable breeding habitat. Implementation of the Preferred Alternative is not expected to have a direct impact on individual toads since no occupied breeding meadows are within 0.78 mile (maximum dispersal distance) of the project boundary, and it is unlikely that toads will be present within the perimeter (NPS 2018).

Impacts from Prescribed Fire and Pile Burning

General Wildlife

Impacts to wildlife from prescribed fire and pile burning under the Preferred Alternative would be similar to those described for the No Action Alternative. The primary difference is that prescribed fire could occur within a larger area under the Preferred Alternative and across a wider variety of wildlife habitat, including Soda Springs Meadow. Direct adverse impacts to wildlife and their habitat would be short term, and MIST measure WLDF-1 would be implemented to reduce short-term impacts. The long-term beneficial impacts to wildlife habitat from prescribed fire, which include a varied habitat structure suiting a diverse wildlife assemblage, would be greater under the Preferred Alternative.

Special-Status Species

Impacts to the Yosemite toad from prescribed fire and pile burning under Alternative B would be similar to those described for the No Action Alternative. The primary difference is that prescribed fire could occur within a larger area under the Preferred Alternative and across a wider variety of wildlife habitats, including Soda Springs Meadow. However, not all units would be treated at one time, leaving large areas of suitable habitat available. Implementation of the Preferred Alternative is not expected to have a direct impact to individual toads since no occupied breeding meadows are within 0.78 mile (maximum dispersal

distance) of the monument boundary, and it is unlikely that toads will be present within the perimeter (NPS 2018).

Impacts from Manual Fuels Treatments

General Wildlife

Impacts to wildlife from manual fuels treatments under the Preferred Alternative would be similar to those described for the No Action Alternative. The primary difference is that manual fuels treatments could occur within a larger area under the Preferred Alternative and across a wider variety of wildlife habitats. Direct adverse impacts to wildlife and their habitat would be short term. The long-term beneficial impacts to wildlife habitat from manual fuels treatments, which include a varied habitat structure suiting a diverse wildlife assemblage and the prevention of large-scale, severe wildfires, would be greater under the Preferred Alternative.

Special-Status Species

Impacts to the Yosemite toad from manual fuels treatments under the Preferred Alternative would be similar to those described for the No Action Alternative. The primary difference is that manual fuels treatments could occur within a larger area under the Preferred Alternative and across a wider variety of wildlife habitat, including Soda Springs Meadow. Adverse impacts to potential over-wintering habitat would be short term; however, implementation of the Preferred Alternative is not expected to have a direct impact on individual toads since no occupied breeding meadows are within 0.78 mile (maximum dispersal distance) of the monument boundary and it is unlikely that toads will be present within the perimeter (NPS 2018).

Cumulative Impacts

Cumulative impacts to wildlife and special-status species from wildfire suppression, prescribed fire, and manual fuels treatments under the Preferred Alternative would be the same as those described for the No Action Alternative, except that the Preferred Alternative would result in greater impacts to a larger area of wildlife habitat in the short term. Under the Preferred Alternative, the impacts of managing unplanned ignitions on wildlife habitat would be adverse in the short term and beneficial in the long term; however, the extent of these effects are somewhat unpredictable. While the use of wildland fire for multiple objectives would result in direct mortality of some wildlife, temporarily displace others, and remove habitat, when combined with other actions within the monument listed in Section 3.1 (e.g., the monument's Invasive and Non-native Plants Program) and implementation of WLDF-1, such activities are expected to provide long-term benefits through improved ecosystem functioning, improved resilience to wildfire across a broader area, and a return to a more natural fire regime.

3.4.2.3 Conclusion

The effects on wildlife and special-status species as a result of suppression activities, prescribed fire, and manual fuels treatments would be the similar under both alternatives. However, these effects would occur across a larger area under the Preferred Alternative, and fire management activities and treatments could have a longer duration, which would result in a greater contribution to improved forest resilience and result in beneficial impacts to wildlife habitat over the life of the FMP. Under the No Action Alternative, all unplanned ignitions would be suppressed and wildfire for multiple objectives would not be employed. This has the potential for long-term adverse impacts to wildlife habitat, as it would prevent the return of a natural fire regime and more resilient ecosystem. Under the Preferred Alternative, the impact of managing wildfire for multiple objectives would result in short-term adverse impacts and substantial long-term beneficial impacts to general wildlife and habitat for the Yosemite toad.

3.5 VISITOR EXPERIENCE

3.5.1 Affected Environment

Visitation at the monument averages approximately 150,000 people per year (NPS 2017a).

The closest communities to the monument are Mammoth Lakes to the east, Lee Vining and June Lake to the northeast, and Bishop to the southeast. The peak season of visitation is mid-June through Labor Day, and the average length of stay for day use is 4 to 5 hours and for overnight use, 2½ days. During September and early October, visitation can be high, with parking lots exceeding capacity, particularly when weather is pleasant and fall colors vibrant (NPS 2017a).

The only vehicle access to the monument is a 13-mile route that starts at the junction of Highway 395 and CA State Highway 203 in the Town of Mammoth Lakes and then continues to Minaret Vista, where the route becomes Forest Service Reds Meadow Road for 6 miles to a turnoff to the Postpile Road. Private vehicle use is highly regulated during most of the summer when visitors are directed to use the shuttle service provided by the Eastern Sierra Transit Authority to visit the monument. Heavy snows limit vehicular access and force a road closure in winter. Visitor services in the valley cease after October 31, or when the road to the monument is closed due to snow and ice after October 15. Access to the monument in the fall when the shuttle buses are not in operation is primarily via private vehicles. The number of visitors accessing the monument during the winter months is very small, though winter use has been increasing in recent years (NPS 2017a). Legal winter access is by backcountry skiing or snowshoeing, although snowmobiles that are allowed on the adjacent INF lands occasionally trespass into the monument. The road typically reopens and visitor services resume in early to mid-June, though winters with exceptionally high snowfall have pushed opening day into late June.

The monument is used as an access point for backcountry hikers heading for the Pacific Crest National Scenic Trail (PCT) and the John Muir Trail, estimated at 6,000 hikers each summer, as well as approximately 1,500 equestrians, most of which are commercial day trips to Rainbow Falls from the Reds Meadow Pack Station (NPS 2017a). The monument also provides access to a wilderness experience that includes both the 231,279-acre Ansel Adams Wilderness (of which it is a part) and the adjacent 651,992-acre John Muir Wilderness.

The monument provides natural soundscapes, dark night skies, clean air, clear water, and unspoiled natural vistas. These are important for the health and viability of native flora and fauna and are a key component of a high-quality visitor experience. The rustic setting and traditional monument experience bring visitors closer to the land by providing opportunities for solitude, exploration, experiencing simple pleasures, and developing a sense of place. The natural soundscape (i.e., natural quiet) at the monument is a special resource to monument visitors, especially in the wilderness portion of the monument.

The monument is one of the best examples of a natural soundscape found anywhere in the national park system and includes natural sounds that are part of the biological or physical resources of the monument (NPS 2017b).

The quality of the acoustic environment (soundscape) affects visitor experience and ecological function. An assessment of the acoustic environment at the monument indicates that conditions are good, with aircraft and vehicles contributing the highest proportion and frequency of anthropogenic sound (Formichelli et al. 2007). While the monument does experience some degradation of air quality and natural soundscapes, its remote location in a valley bottom far from large cities provides a buffer from air and light pollution (NPS 2017b). Conditions may deteriorate due to anticipated increases in aircraft traffic in recent decades (NPS 2017b). However, commercial air tours from the local Mammoth Lakes Airport are not allowed over the monument (NPS 2017b).

The monument supports and maintains unusually rich ecological diversity reflective of its location at the intersection of three biogeographic regions. The physical setting and context create exceptional opportunities for scientific study and shared learning by visitors (NPS 2017a). Scientific interpretation

has been a major theme in the monument's management history and is articulated in the enabling legislation that states that the unit will be protected for its scientific value and public interest. The monument's staff contribute to efforts that strengthen the scientific partnerships and landscape-level coordination, and encourage the public to participate in interpretive, educational, and stewardship opportunities (NPS 2017a), all of which have the potential to be impacted under each alternative.

3.5.2 Environmental Consequences

3.5.2.1 Alternative A: (No Action Alternative) Full Suppression with Limited Fuel Treatments

Impacts from Wildfire Suppression

Under the No Action Alternative, fire management would include suppression of all wildfires within the monument boundary. If wildfire behavior has the potential to endanger visitor or employee safety, a temporary restriction or closure of a portion of the monument may be issued by the Superintendent. A full suppression strategy in the event of an unplanned ignition would typically result in fast containment of wildfire in accessible portions of the monument and thereby reduce the duration and scope of adverse impacts to visitor use. Although smoke and closures would cause impacts to visitors utilizing the monument for hiking, fishing, and other recreational activities, other areas in adjacent public lands would remain open to visitor use and would have similar resources available.

Potential activities associated with fire management, specifically the use of aircraft during suppression actions, could generate short-term, temporary noise that would impact visitors' experience, wildlife, and wilderness character within the monument during the suppression action. If authorized, Unmanned Aircraft Systems may be used to gather information regarding fire size and fire behavior, which would minimize noise impacts when compared to larger aircraft. All Unmanned Aircraft Systems use within the monument would be used in conformity with general aviation regulations for parks and wilderness (see MIST measures, Appendix D). Retardant drops are typically not conducted as part of wilderness fire suppression efforts, unless life, property, or significant resources are threatened, also limiting the potential for aircraft noise to impact the monument soundscape. Water drops would be authorized and could be used for targeted suppression.

Additional suppression tactics like the creation of containment lines and use of manual equipment may adversely impact visitor experience due to visual degradation of the natural resource. Visual impacts from suppression actions may last several growing seasons post-fire, depending on the vegetation type and rate of post-fire recovery. If trees are cut as part of firelines, it would take several decades for these specific areas to fully recover.

No motorized vehicles or heavy equipment or vehicles (such as graders, bulldozers, or other tracked vehicles or earthmoving equipment) would be used off of established roads without the authorization of the Superintendent or designee. Therefore, heavy equipment and vehicle-related impacts would be restricted to already developed northeastern area of the monument, and MIST would be applied to reduce the intensity of those impacts.

Beneficial impacts to visitor use and experience would be derived from the protection and preservation of monument values as a result of successful wildfire suppression activities. There may also be opportunities for public education and outreach during the wildfire. Beneficial impacts of managing fire for multiple objectives would not be realized under Alternative A, and wildfire hazard would remain high as fuels continue to accumulate across the monument.

Impacts to visitor use and experience would be adverse in the short term, due to smoke impacts and closures, but would last only for the duration of the fire or until it is safe for visitor use to resume. In the event that dangerous conditions exist post-fire—for example, risk of rock fall, amplified stream flows,

and hazard trees—some closures may last for 1 to 2 years and for intermittent periods (during and following storm events).

Impacts from Prescribed Fire and Pile Burning

Prescribed burning and pile burning would occur on the 113 acres of non-wilderness within the monument boundary. Fire management activities, most likely to occur in the fall, could result in short-term closure of certain areas of the monument, including trails. Detours for trail closures would be provided whenever feasible. These closures would cause short-term adverse impacts to visitor use and experience that would last for the duration of the burn (several days). Prescribed burning and pile burning would also create smoke, which may impact the experience of some visitors with smoke sensitivities and adversely impact visitor activities such as hiking, photography, and smoke-free sightseeing. These burns would likely not occur in the peak visitation season from mid-June to Labor Day. Prescribed burning would not be permitted by the Air District during conditions that would significantly degrade visibility and present a risk to public health and safety. These restrictions, coupled with the development of a prescribed burn plan that specifies weather conditions to ensure effective smoke dissipation, would mitigate most public health and safety concerns of prescribed fire and pile burning. The duration of impacts to visitor access and public health would correlate to the duration of prescribed burn activities and would be minimized through the use of mitigation measures described in Appendix D. Smoke impacts are discussed in more detail in Section 3.2, Air Quality.

There would be short-term, adverse visual impacts within the vicinity of affected areas and within the viewshed of the treatments due to the change in appearance following treatment. Treatment locations may fall within the viewshed for visitors the PCT and John Muir Trail, and for visitors to the monument using one of the two designated viewpoints at Devils Postpile and Rainbow Falls. Figure C. 10 through Figure C. 14 (in Appendix C) illustrate pre- and post-treatment conditions following a 2015 prescribed burn at the monument. Some grasses and other herbaceous vegetation were returning in the understory by 2016. From these photos it is clear that some scorching and charring of trees trunks and downed logs may last for 1 to 2 years post-burn. However, scorching and charring are not uncommon or unexpected in forests and are part of the visitor experience in a natural environment. Photographs (see **Error! Reference source not found.** through Figure C. 14 in Appendix C), show an area of the monument before and after a prescribed burn is conducted to illustrate the potential visual impact.

A viewshed analysis was performed using ArcGIS to identify all areas that can be seen from the PCT and viewpoints within the monument (Figure C. 15 through Figure C. 17, Appendix C), modeled on a non-vegetated landscape. This analysis can be considered very conservative, because existing vegetation would help minimize impacts to visual resources by screening views of the treatment areas. The PCT analysis illustrates that there are portions of the monument that are visible from the trail for periods up to 15 minutes of hiking (assuming a hiking speed of 2 mph) as indicated with medium to dark brown shading. Prescribed fire and pile-burning treatments in the non-wilderness portion of the monument (located in the northeast corner of the monument) would be visible from the PCT, as indicated in dark brown in Appendix C, Figure C. 15.

Large portions of the monument are also visible from the Devils Postpile Formation Area in Appendix C, Figure C. 16 as indicated in yellow shading. The non-wilderness portion of the monument, where prescribed fire and pile burning could occur under the No Action Alternative, would be visible from the Devils Postpile Formation Area.

Prescribed fire treatments applied under the No Action Alternative are unlikely to be visible from the Rainbow Falls viewpoint due to its southerly location relative to the non-wilderness portion of the monument, which is in the northeast corner (see Figure C. 17 in Appendix C). Overall, the planned prescribed fire treatments would generate visual impacts from the PCT and Devils Postpile viewpoints. Prescribed fire treatments would result in direct short-term impacts through the added contrast in color between the burned and unburned areas as vegetation is blackened or scorched. Within a few years, these

impacts would lessen as revegetation and green-up occurs. When prescribed burns are being conducted, smoke would also obscure scenic views that would be visible from the PCT, John Muir Trail, and designated viewpoints within the monument. Smoke production would be of limited duration, lasting for the duration of the treatment, typically a few hours to a few days.

Prescribed burning presents an opportunity for scientific interpretation and discussion with the public of the role of fire as a natural process in the monument, and the goal of the NPS to restore a more natural fire regime, and the use of prescribed fire to accomplish this goal while reducing the potential for a high-severity wildfire to occur. An effective public information and interpretation program would help educate visitors about long-term benefits of prescribed fire while also offsetting adverse impacts to visitation.

Because much of the vegetation in the monument is fire adapted, prescribed fire would benefit native species and in turn improve ecosystem functioning over the long term. Both prescribed burning and pile burning would remove excess fuels and open canopies returning vegetation to a closer approximation of historic (pre-European settlement) conditions. This would provide benefits for wildlife, improving wildlife viewing opportunities, and would create a more visually desirable mosaic of vegetation, enhancing the overall viewshed and nature-viewing opportunities. Because prescribed fire actions would be employed in a way to restore the composition, structure, vigor, and resilience of native vegetation within the monument, visitor experience is expected to improve in the long term as many visitors are attracted by the monument's natural setting. In the long term (years to decades), fire management actions that reduce hazardous fuels would reduce the potential for more damaging wildfires that could potentially create more restrictions and adverse impacts on visitor use and experience.

Impacts from Manual Fuels Treatments

Manual fuels treatments would occur within the 113 acres of non-wilderness in the monument, with 25 acres in the monument treated per year, lasting 5 to 7 days per occurrence. Treatments would result in localized short-term adverse impacts to visitor experience because of localized trail or area closures or noise from equipment and chainsaws. Since manual fuels treatments are only applied in non-wilderness areas of the monument, and most treatments would be carried out on a small scale, most visitor use could continue to occur at other locations of the monument. Outreach to the public regarding safety during treatments may allow most visitor experiences to continue while management activities take place.

Manual treatments would result in a change to the vegetation composition and structure in treated areas that may impair visual quality immediately post-treatment. The visibility of these impacts within the viewshed would be the same as described above for prescribed burning, except that manual fuels treatments would typically be smaller in scale and with removal of treatment slash, would be less visually obtrusive across the viewshed. Depending on the vegetation type where the manual treatments occur, some areas would be restored to a more natural condition within one growing season post-treatment.

For slower growing vegetation, such as trees, visual impacts may be more long term, lasting several growing seasons. The mitigating effects of manual treatments in reducing fuel hazards around monument facilities, reduces the potential for unplanned ignitions to threaten monument infrastructure and natural and cultural resources, therefore resulting in the preservation of monument resources for visitor use over many decades. Impacts, therefore, are expected to be short term and adverse for the duration of the treatment and for one to two growing seasons, up to several years for some vegetation types, post-treatment, and beneficial in the long term by preserving the monument's natural, cultural, and physical resources.

Cumulative Impacts

The geographic extent for the analysis of cumulative impacts on visitor use and experience is the monument viewshed and the adjacent INF. The temporal scope of cumulative impacts on visitor use and experience is the duration of the impacts, which would coincide with the duration of prescribed burn or

manual treatment activities, a period of several days when considering impacts to visitation, and long-term impacts for a period of several years or more when considering the visual impacts from fire management activities in slow-growing vegetation communities. Section 3.1 outlines the past, present, and reasonably foreseeable future actions that may contribute to cumulative impacts to resources analyzed in this EA. All these actions could impact visitor use and experience at the monument.

Forest management actions proposed under the INF Forest Plan revision could cause short-term adverse impacts to visitor use and experience by contributing reduced visibility from smoke, visual impacts of burned and charred forest, and adverse impacts to natural resources and wildlife that may impact wildlife viewing opportunities. Long-term beneficial impacts from the INF Land Management Plan revision would include restored native wildlife habitat and forest communities, thereby providing beneficial impacts to visitor use and experience through improved opportunities for wildlife viewing and scenic quality within the viewshed of the monument. Road improvements occurring on Reds Meadow Road may be visible from the monument trails and viewpoints and would adversely impact the visitor use and experience due to delays and visual impairment for the duration of the construction activity. However, the improvements would provide overall beneficial impacts by improving public safety, reducing traffic and congestion along the only access road to the monument, thereby improving access for recreational activities. The INF Mammoth Ranger District Reds Meadows Hazardous Fuels Reduction project would cause short-term adverse impacts to visitor use due to the presence of heavy equipment, which may create congestion for the duration of the treatment, which could last for 5 or more years. Noise from treatments would adversely impact some users close to the treatment location and at some distance, depending on noise volumes. The treatments would further improve public safety along Reds Meadows road by reducing the risk of catastrophic wildfire, providing long-term benefits for visitor use and experience.

The Interagency Strategic Plan would provide short-term and long-term beneficial impacts to visitor use and experience by improving overall operations and visitor safety at the monument and the Reds Meadow Valley by improving parking and shuttle operations, reducing congestion during peak periods, and managing congestion when it occurs. The Interagency Public Safety Response Plan for the Reds Meadows Valley and the monument would further improve public safety over the long term by addressing evacuation planning and identifying safety zones within the monument. Vegetation management undertaken as part of the Invasive and Non-Native Species Program may result in some short-term adverse impacts to visitors associated with closures and noise during planned vegetation management actions, but in the long term these actions would improve ecological functioning in the monument, improve vegetation health and vigor, and improve resilience to disturbances, including wildfire, insect, and disease, and invasive species. Improvements to the natural resource would contribute to the visitor experience for many decades. Overall, these actions would contribute short- and long-term impacts, which would be both adverse and beneficial to visitor use and experience.

Impacts to visitor use and experience would occur under the No Action Alternative in the form of temporary, localized degradation of air quality, noise impacts from suppression activities, short-term closures during planned management actions, and short-term visual impacts within viewsheds as treatment locations recover. Impacts from the No Action Alternative plus impacts from the past, present, and reasonably foreseeable future actions described above would result in short- and long-term adverse and beneficial cumulative impacts to visitor use and experience. The incremental impacts of the No Action Alternative would contribute slightly to, but would not substantially change, the impacts that are already occurring within the analysis area.

3.5.2.2 *Alternative B: Targeted Suppression with Limited Managed Wildfire and Monument-wide Fuels Treatments (Preferred Alternative)*

Impacts resulting from manual fuels treatment, prescribed fire, and wildland fire suppression would be similar to those described under the No Action Alternative for these activities, but the actions would occur on a larger scale on the monument because prescribed fire and manual fuels treatment would be allowed to occur within the 687 acres of designated wilderness.

Impacts from Wildfire Suppression and Wildfire for Multiple Objectives

The impacts from wildfire suppression actions would be the same as under the No Action Alternative, with a distinction in the wildfire suppression tactics that could be utilized. Alternative B provides fire managers with the option to choose to either immediately suppress a fire, or to manage unplanned ignitions throughout the monument when conditions allow for the fire to burn without immediate suppression. Several criteria would be assessed as part of decision making, with public safety being a primary factor determining suppression strategy. The decision to utilize management of the fire would typically vary, depending on the location of the wildfire. Full suppression, for example, is more likely to occur when an unplanned ignition occurs in the General Wildfire Protection Zone, due to the density of values at risk; or when wildfire is ignited under drought-related fuel conditions, where weather forecasts and fuel conditions suggest fire behavior could threaten life and property. Allowing wildfires to burn more acres could potentially increase the chances that there will be threats to human life, property, and critical natural and cultural resources. Some of these may require post-fire treatments that affect visitor experience. To a certain degree, variables that contribute to post-fire threats may be identified (e.g., areas of heavy public use, areas highly susceptible to erosion, stream crossings with low freeboard) and taken into account during the management of the wildfire. All human-caused ignitions would be suppressed.

Direct adverse impacts using wildland fire for multiple objectives may include minor displacement of some visitor activities for longer periods as the fire is allowed to burn; however, based on recent fire occurrence a jointly managed wildfire with the INF could last several weeks over the course of a year in total. There would be an incremental increase in smoke in scenic views and temporary restrictions in access to some areas, and increased areas of temporarily blackened vegetation that would be visible from the PCT, John Muir Trail, and designated viewpoints within the monument. Smoke production would be of limited duration, usually lasting a few hours to a few days. Exceptions may occur when a wildfire is managed for multiple objectives or when meteorological conditions, such as an inversion, exist and smoke may linger for a longer period.

Some visitors would be disappointed to see blackened areas following a wildfire. This would be a short-term, adverse, localized effect that would persist until vegetation regrows. Blackened areas usually green up in the following growing season, depending on vegetation type where the wildfire occurs, burn severity, precipitation levels, and the time of year. The visitor experience would improve when green vegetation and wildflowers emerge in the spring. The use of wildfire for multiple objectives and its effects on vegetation may present an opportunity for scientific study, education, and interpretation of natural resource values and processes, which may result in a long-term beneficial impact.

By allowing larger areas to burn under appropriate conditions, beneficial impacts to ecosystem resilience would be magnified, and ecological benefits, reduced fuel loading, restoration of forest structure, and restoration of a more natural fire regime would have long-term benefits for the preservation of monument resources, which in turn provide more opportunities for visitor use and experience.

Impacts from Prescribed Fire and Pile Burning

The impacts of prescribed fire and pile burning would be the same as discussed under the No Action Alternative, with the addition that impacts may occur within wilderness areas as the FMP revision allows

the monument to implement prescribed fire treatments within all three strategic wildfire management zones. Under Alternative B, it is anticipated that up to 100 acres would be burned annually with prescribed fire (broadcast burning) and that pile burning would be utilized to reduce fuel loading throughout wilderness and non-wilderness lands. As described under the No Action Alternative, prescribed fire activities would result in some localized closures of trails and facilities; however, because of the small scale of treatments and the large area of additional wilderness lands available to visitors, most visitors would be able to avoid the treatment location, and therefore the adverse impacts to visitors would last only for the duration of the treatment, which may last approximately 1 week.

Visual impacts from prescribed fire applied across the monument would be visible to more users than under the No Action Alternative. According to viewshed analysis completed by the NPS (see Figure C. 15 through Figure C. 17 in Appendix C), prescribed fire treatments occurring within the wilderness portion of the monument would be visible from all trails and viewpoints, including the Rainbow Falls viewpoint. These visual impacts would be adverse in the short term for some visitors but would provide long-term beneficial impacts for nature viewing and scenic value.

By reestablishing fire in wilderness areas, the monument moves closer to its goal of restoring a more natural fire regime and forest structure to increase resilience to the effects of wildfire and other stressors. This would provide short-term beneficial impacts to visitor use and experience through opportunities for scientific interpretation and outreach, and long-term beneficial impacts as vegetation condition is improved, viewsheds are enhanced, and the potential for more severe adverse impacts to visitor use and experience from large uncharacteristic wildfires is mitigated.

Impacts from Manual Fuels Treatments

The impacts of manual fuels treatments would be similar to the No Action Alternative, with manual treatment impacts also occurring in the wilderness portion of the monument in conformance with the restrictions of the Minimum Requirements Analysis. These treatments would include, thinning and limbing of trees prior to prescribed fire, and treatment of some downed fuels. These activities may require localized closures if treatments would pose a threat to public safety, but most closures would be temporary, lasting at most several days, and visitors would be able to avoid treatment areas by using alternative trails and facilities. Adverse impacts would be short term, lasting only for the duration of the treatment.

Manual treatments under Alternative B would result in visual impacts to users in both the non-wilderness and wilderness areas of the monument. Viewshed analysis shows that manual treatments in support of prescribed burning in the wilderness would be visible from existing trail systems and monument viewpoints. The scale of the treatments would be very limited, and the manual nature of the treatments would be minimally obtrusive to users observing from trails and viewpoints. Most impacts are expected to be short term, particularly where understory vegetation recovers quickly, returning the area to a more natural setting within one growing season.

As these treatments contribute to the overall program to improve ecosystem condition and resilience of vegetation to wildfire, the actions would provide long-term beneficial impacts to visitor use and experience by preserving and improving the condition of the monument and the natural and scenic values for many decades.

Cumulative Impacts

The geographic and temporal scope and the range of projects of the cumulative impacts analysis for visitor use and experience are the same as under the No Action Alternative.

Cumulative impacts of the Preferred Alternative would be similar to those described for the No Action Alternative, with increased long-term beneficial impacts resulting from increased management actions occurring within the wilderness portion of the monument, which would result in greater protections of

monument values that are intrinsic to visitor use and experience. The Preferred Alternative would contribute short-term adverse impacts to visitor use and experience when added to past, present, and reasonably foreseeable actions, but would provide beneficial impacts by reducing adverse effects of unplanned ignitions that impact the experience of users on the monument and adjacent public lands. The Preferred Alternative would also provide beneficial impacts by restoring viewsheds and enhancing visitor use and experience. The incremental impacts of the Preferred Alternative would contribute to, but would not substantially change, the short-term adverse impacts to the visitor experience and the long-term beneficial impacts of reducing risk of a catastrophic wildfire and improving ecosystem condition and resilience.

3.5.2.3 Conclusion

Under both alternatives, visitor use and experience would be impacted both directly and indirectly by wildfire occurrence within the monument. Depending on the extent, severity, and season of a wildfire, visitors may be adversely impacted due to trail and area closures, noise impacts from suppression activities, visual impacts from smoke as well as charred and blackened landscapes, and public health and safety concerns relating to smoke duration and fire management activity. Most adverse impacts from wildfire would generally coincide with the duration of the wildfire and post-fire rehabilitation activities, though post-fire effects may have long-term impacts on visual quality within the monument viewshed. Planned management actions under both alternatives would have short- and long-term adverse impacts due to closures and area restrictions, noise impacts, and visual impacts, but long-term beneficial impacts by providing protection of values at risk within the monument, improved ecological functioning, which provides improved scenic quality within the viewshed, reduced wildfire risk, which would otherwise threaten public health and safety, and increased opportunities for scientific interpretation. In the long term, recreational and visitor experiences would be positively impacted by planned actions under both alternatives.

The main difference between the No Action Alternative and the Preferred Alternative is the number of acres subject to prescribed burning and manual fuel treatments. Under the Preferred Alternative, more acres would be able to be treated through proactive fire management that would move vegetation closer to the historic range of natural variability and reduce hazardous fuel loading. Additionally, the ability to manage naturally ignited wildfire for multiple objectives, including resource benefits, would also be implemented throughout the monument under the Preferred Alternative. The introduction of hazardous fuels treatments in wilderness and the use of wildfire for multiple objectives would reduce the risk of catastrophic fire throughout the monument and associated adverse impacts to visitor use and experience. Therefore, the Preferred Alternative would result in long-term beneficial impacts to visitor use and experience in wilderness and non-wilderness areas.

3.6 WILDERNESS CHARACTER

3.6.1 Affected Environment

The majority of the monument is designated as wilderness and many visitors use it as a gateway to exploration, understanding, and appreciation of the qualities of wilderness character. The monument lies adjacent to a large protected area that includes the Ansel Adams and John Muir Wilderness. The monument also includes 2 miles of the Pacific Crest and John Muir Trails. These wilderness areas provide extensive opportunities to experience untrammeled Sierra mountain landscapes (NPS 2017b).

The NPS participates in an interagency wilderness monitoring strategy (Landres et al. 2008), with the goal of improving wilderness stewardship. The strategy provides managers with tools for assessing how wilderness character is changing over time. The strategy focuses on five qualities of wilderness derived from the Definition of Wilderness in the 1964 Wilderness Act, which are directly tied to wilderness character, and not on other qualities of wilderness. These five qualities of wilderness are:

- Untrammeled quality of wilderness
- Natural quality of wilderness
- Undeveloped quality of wilderness
- Opportunities for solitude or a primitive and unconfined recreation
- Other features of value (NPS 2017b)

Wilderness within the monument is generally unhindered and free from most human manipulation. However, fire suppression does occur and degrades the untrammeled quality of wilderness. Other human influences in wilderness may include small ecological restoration projects to protect or improve the natural quality of wilderness (NPS 2017b).

Due to its relative isolation and position within a largely intact landscape managed as wilderness, natural resources within the monument are relatively unimpacted. However, outside stressors and threats, such as air quality, can affect natural systems. In addition, some non-native plants and animals occur in the monument. The most profound impact on the natural quality of wilderness is fire exclusion and the resulting altered fire regime. The 1992 Rainbow Fire resulted in unprecedented high severity due to unnatural accumulation of fuels and high density of trees after nearly 100 years of fire exclusion (NPS 2017b).

The undeveloped quality of wilderness character in the monument is generally good. Installations include small temperature sensors, U.S. Geological Survey river gaging equipment, and groundwater monitoring wells. Motorized equipment, such as chainsaws, may be used for administrative purposes, consistent with MRAs. The monument carefully reviews any new proposed installations and considers cumulative impacts and relevancy before making a determination (NPS 2017b).

The wilderness within the monument offers a range of opportunities for solitude or primitive and unconfined recreation. The range extends from the well-visited wilderness portal at Rainbow Falls to the John Muir trail. The easy access to wilderness within the monument does mean that opportunities for solitude can be compromised during peak visiting hours at the height of the summer season. However, morning and evening hours and the shoulder seasons offer visitors and wilderness enthusiasts more solitude, even at Rainbow Falls.

Opportunities for primitive and unconfined recreation are reduced by several facilities that decrease self-reliant recreation. Trails are well developed, and signs at trail junctions are common. The viewing area at Rainbow Falls includes interpretive panels, a hitching post, formalized viewing platforms, and a staircase to the base of the river. In addition, the Soda Springs Bridge and Stock Bridge, as well as signage, reduce opportunities for primitive recreation in these specific areas. In most areas of the monument, solitude or primitive and unconfined recreation is available at all times. However, the substantial increase in numbers of hikers on the PCT and John Muir Trail (both pass through the monument) in the past 5 years may reduce opportunities for solitude (NPS 2017b).

3.6.2 Environmental Consequences

3.6.2.1 *Alternative A: (No Action Alternative) Full Suppression with Limited Fuel Treatments*

Impacts from Wildfire Suppression

Under the No Action Alternative, all unplanned ignitions would be fully suppressed in the 687 acres of designated wilderness within the monument. Suppression activities would affect all five qualities of wilderness character (untrammeled, natural, undeveloped, solitude or primitive and unconfined recreation, and other features of value).

Untrammeled: The implementation of fire management activities, such as full suppression of all unplanned fires, adversely affects untrammeled character as all unplanned ignitions, including natural ignitions necessary to promote ecosystem processes, would be suppressed.

Natural: The monument is a fire-adapted ecosystem (average 15-year natural fire return interval) where fire exclusion has occurred for approximately 120 years, degrading the natural quality. Continuing the No Action Alternative would result in severe adverse effects, as the fire-adapted ecosystem would continue to be deprived of a keystone natural process until an uncontrollable ignition (similar to the 1992 Rainbow Fire) exceeds the agencies' ability to control it, resulting in uncharacteristic fire severity and effects. A full analysis of the effects on wildlife and wetlands/vegetation (i.e., elements of natural) is included in previous sections; this section focuses on the effects in general on the natural quality of wilderness character.

Undeveloped: Negative impacts would occur from the use of motorized equipment (saws, pumps, etc.) for fire suppression and the installation of long-term plot markers for monitoring.

Solitude or Primitive and Unconfined Recreation: Impacts to wilderness access and solitude (sights and sounds of equipment, presence of fire management staff, aircraft, etc.) are expected to occur during and following wildfire operations. Also, opportunities for primitive and unconfined recreation could be reduced temporarily if a large-scale and severe wildfire occurs in the monument, resulting in restricted access or trail closures.

Other Features of Value: Infrequent but potentially major impacts from emergency fire suppression activities and/or high-severity fire behavior could occur, resulting in damage to sensitive resources. The cultural resources that fall under "other features of value" are analyzed in Section 3.7, Cultural Resources.

Suppression actions within the wilderness portion of the monument would require conformance with the Wilderness Act, and adherence to the MRA (see Appendix G) and MIST measures outlined for wilderness character in Appendix D, this would partially mitigate impacts on the undeveloped quality of wilderness character by ensuring that appropriate tools and techniques are considered.

Impacts from Prescribed Fire and Pile Burning

Prescribed fire and pile burning would not be implemented in wilderness areas under the No Action Alternative; thus, there would be no impact to wilderness character.

Impacts from Manual Fuels Treatments

Manual treatments would not be implemented in wilderness areas under the No Action Alternative.

Cumulative Impacts

The geographic extent for the analysis of cumulative impacts on wilderness character extends from the monument wilderness boundary to the boundary of the Ansel Adams and John Muir Wilderness units. The temporal scope of cumulative impacts on wilderness is the duration of the impacts, which would coincide with suppression activities, a period of several days when considering impacts to the five wilderness characters, extending to a longer period of several years when considering the visual impacts from fire management activities. Section 3.1 outlines the past, present, and reasonably foreseeable future actions that may contribute to cumulative impacts to resources analyzed in this EA. The following actions could impact wilderness character at the monument.

Forest management actions proposed under the INF Forest Plan revision could cause cumulative short-term adverse impacts to untrammeled, natural, undeveloped, and solitude qualities of wilderness character if those actions occur within designated wilderness. The National Forest contains approximately 1 million acres of wilderness (approximately one-half of the forest land), in nine wilderness areas; therefore, a large portion of management is expected to impact wilderness units. Wilderness character would be

adversely impacted by the presence of crews and equipment needed to implement actions, which affects opportunities for solitude and the undeveloped wilderness qualities. These impacts, when combined with activities undertaken as part of the Non-Native Species Program within the monument, which involve removing non-native species using a combination of methods, and planning and restoring areas, may result in cumulative adverse impacts to wilderness character, particularly the untrammeled and natural qualities of wilderness. In the long term, these actions would improve ecological functioning in the monument, improve vegetation health and vigor, and improve resilience to disturbances, including wildfire, insect and disease, and invasive species. These actions would result in a long-term benefit to the natural quality of wilderness.

Road improvements and fuel reduction activities that are occurring on Reds Meadow Road that may be visible from, or within the soundscape of, the monument trails and viewpoints located within wilderness areas, and would cause adverse impacts to wilderness character, as opportunities for solitude would be lost for the duration of the construction and fuels treatment activities. The Interagency Strategic Plan would enhance parking and shuttle operations, improve operations at the monument, and expand recreational opportunities, including use of the trail system through wilderness areas. These actions may result in cumulative adverse impacts to wilderness characteristics by increasing visitor volumes, further reducing opportunities for solitude within the wilderness. These impacts would be most apparent during the peak visitor season. Opportunities for solitude would still be available within adjacent wilderness areas; therefore, visitors could go elsewhere to find areas where they can experience solitude. Visitors seeking solitude could avoid the monument during busy periods and visit during the shoulder or low seasons.

Mitigation measures to minimize the visual and audible impacts of actions to wilderness users, for example carrying out construction activities during the low season, would alleviate some adverse short-term impacts, but visitor numbers are expected to gradually increase over the coming decades.

Impacts to wilderness character would occur under the No Action Alternative due to heightened risk for catastrophic wildfire, which would result in temporary, localized impacts to visual resources, due to blackening and charring of vegetation and the presence of smoke, increased human activity, and short-term closures during planned management actions, which would confine wilderness recreation activities. Impacts from the No Action Alternative plus impacts from the past, present, and reasonably foreseeable future actions described above, would result in short- and long-term adverse and beneficial cumulative impacts to wilderness character. The incremental impacts of the No Action Alternative would contribute slightly to, but would not substantially change, the impacts that are already occurring within the Ansel Adams Wilderness.

3.6.2.2 *Alternative B: Targeted Suppression with Limited Managed Wildfire and Monument-wide Fuels Treatments (Preferred Alternative)*

Impacts from Wildfire Suppression

Alternative B provides fire managers with the option to either immediately suppress a wildfire or to manage unplanned ignitions within wilderness areas when conditions allow for the fire to burn without immediate suppression. All human-caused ignitions would be fully suppressed throughout the monument. Several criteria would be assessed as part of decision making, with public safety being a primary factor determining suppression strategy. The range of strategies available under this management action would result in a range of impacts to wilderness, depending on which strategies are chosen, the location of the fire, and the season of the fire. These suppression impacts would be consistent with those discussed above for the No Action Alternative but would typically be less intense than full suppression strategies, would occur for longer periods ranging from one to five weeks in duration, and would be followed by one to five days of fireline rehabilitation.

This type of management response strategy may allow for more acres to burn, improving natural fire-adapted vegetation conditions and perpetuating natural processes. The use of management for multiple objectives would help to restore and maintain elements of wilderness character (especially natural character) consistent with Wilderness Act provisions. The flexibility of utilizing various suppression strategies would help to balance protection of special features with other resource goals and objectives to promote the natural role of fire across the landscape and protect and perpetuate the untrammelled character of the wilderness.

Impacts from Prescribed Fire and Pile Burning

Prescribed fire, including pile and broadcast burning, would have temporary negative impacts on the untrammelled, undeveloped, solitude, and other features of values qualities of wilderness character.

Untrammelled: Prescribed fire and pile burning are an intentional manipulation of the wilderness, and result in a trammel. Under this alternative, vegetation would be removed, trees thinned, limbed, or cleared, and firelines constructed, all which result in a trammel.

Natural: Fire is a natural part of ecosystem processes in the monument, and prescribed fire would result in reduced heavy fuel accumulation and invasive vegetation, leading to a healthier, more diverse ecosystem over time and increasing the likelihood for safe and effective management of naturally occurring fires, improving the natural quality of wilderness character in the long term.

Undeveloped: Broadcast burning would utilize several tools and actions, including vegetation clearance for fireline construction, tree thinning and limbing, snag cutting, placement of pumps, collapsible water tanks and hoselays, sprinklers, hand ignition (drip torch), monitoring, and area closures. The presence and associated noise of mechanized and hand-operated equipment deemed necessary for prescribed fire preparation (e.g., chainsaws, portable pumps) would temporarily affect the undeveloped quality of wilderness. Fire-effects monitoring plots that are installed to inform future management actions would adversely impact the undeveloped character of the wilderness in localized plots due to the use of semi-permanent plot markers and tree tags. These monitoring plots, however, would contribute to the breadth of scientific knowledge on the use of fire to maintain fire-adapted vegetation communities; this knowledge can be applied to enhance the natural quality of wilderness in the long term (years to decades). Overall, the implementation of prescribed fire would leave little imprint as a human-caused effect, as fire is a natural process within the monument.

Solitude: Opportunities for solitude or primitive and unconfined types of recreation would be relatively unaffected, except on a temporary basis during implementation of prescribed fires and pile burning, where there would be temporary closures and impacts from the presence of crews. Prescribed fires would be implemented up to three times a year, if conditions allow, with a typical duration not likely to exceed 1 week per occurrence, including preparation and execution. Monitoring would occur for 1 to 4 weeks a year. Pile burning would be a sporadic activity, occurring approximately once a year, with up to 100 piles and a duration of 2 to 5 days and 1 to 3 weeks of post-burn monitoring. These fire management activities may require the use of motorized equipment that may disturb opportunities for solitude temporarily, coupled with impacts from increased human activity; these impacts would last only as long as the equipment and prescribed burn crews are present in the wilderness area.

Other Features of Value: Other features of value (e.g., the Postpile geological formation, the Rainbow Falls viewshed, and several cultural resources [historic and pre-historic]) within the wilderness would be generally unaffected or protected by fire management activities, except by presence of crews, equipment, or smoke from prescribed fire temporarily affecting visitors to specific sites. Overall, features of value are expected to benefit from management activities that focus on preservation of such values and reduce the chances for severe wildfire.

The MRA and mitigation measures would be reviewed and applied to reduce impacts, including the use of MIST for all prescribed fire operations, fireline rehabilitation to remove unnatural features,

implementation of prescribed fire outside of high visitor seasons when possible, and use of crews with primitive tool skills for prescribed fire preparation.

Impacts from Manual Fuels Treatments

Manual fuels treatments within the wilderness would be limited to pre-treatments of fuels prior to prescribed burning and treatment of some downed fuels from past wind events. Manual treatment actions would average 0.25 acre per year with approximately 1 to 3 days per occurrence. These actions would have a temporary adverse effect on the untrammelled, natural, and undeveloped qualities of wilderness character.

Untrammelled: Manual treatments involve cutting and removing unwanted fuels and vegetation, resulting in a trammeling action.

Natural: Manual treatments would reduce unwanted fuels and invasive vegetation, leading to a healthier, more diverse ecosystem over time and increasing the likelihood for safe and effective management of naturally occurring fires, thus improving the natural quality of wilderness character.

Undeveloped: Manual fuels treatments, such as clearing of firelines in preparation for prescribed fire operations, would impact the undeveloped quality of the wilderness area. The presence and associated noise of mechanized and hand-operated equipment deemed necessary for fire management activities (e.g., chainsaws, portable pumps) would temporarily affect the undeveloped wilderness quality. However, these impacts would be short lived and last only as long as the equipment is present in the wilderness portion of the monument.

Manual fuels treatments under Alternative B would produce some short-term negative effects that can be partially mitigated by careful project timing, adherence to the MRA, and the use of MIST strategies.

Cumulative Impacts

The geographic and temporal scope of the cumulative impacts analysis for wilderness character are described under the No Action Alternative. Similarly, the past, present, and reasonably foreseeable future actions that may impact wilderness character are described under the No Action Alternative. The past, present, and reasonably foreseeable actions would contribute short- and long-term adverse and beneficial cumulative impacts to wilderness character.

Cumulative impacts of the Preferred Alternative would be the same as those for the No Action Alternative, with increased long-term beneficial impacts resulting from the implementation of planned management actions within the wilderness; these actions would improve forest resilience to uncharacteristically severe wildfire, preserving the existing natural wilderness quality for many decades. The Preferred Alternative would contribute slight short-term adverse impacts to wilderness character when added to past, present, and reasonably foreseeable actions. The incremental impacts of the Preferred Alternative would contribute slightly to, but would not substantially change, the impacts that are already occurring within Ansel Adams Wilderness.

3.6.2.3 Conclusion

Under both alternatives, wilderness character would be impacted both directly and indirectly by suppression activities resulting from wildfire occurrence within the monument. The main difference between the No Action Alternative and the Preferred Alternative is that under the No Action Alternative, all unplanned ignitions would be suppressed within the wilderness portion of the monument, resulting in long-term adverse effects on the untrammelled and natural qualities of wilderness character, while under the Preferred Alternative, the monument would be able to use management of wildfire for multiple objectives, which would help to restore and maintain elements of wilderness character (especially the untrammelled and natural qualities). All actions within the wilderness portion of the monument would require conformance with the Wilderness Act and adherence to the MRA (see Appendix G) and MIST

measures outlined for wilderness character in Appendix D. This would partially mitigate degradation of the undeveloped quality of wilderness character by ensuring that appropriate tools and techniques are considered.

Under the Preferred Alternative, planned management actions could occur within the 687 acres of wilderness. Prescribed fire and manual treatments would generate short-term adverse impacts to all five qualities of wilderness character; however, these actions would create long-term beneficial impacts to wilderness quality by protecting natural resources from uncharacteristically severe wildfire and by allowing fire management activities to perpetuate fire-adapted vegetation within the wilderness.

3.7 CULTURAL RESOURCES

3.7.1 Affected Environment

The monument encompasses a diverse landscape of natural and cultural features reflecting the varied activities of many groups of people, including Native Americans, miners, sheepherders, conservationists, scientists, park managers, local residents, and tourists. Erosion, vegetation, wildlife, wildfire, volcanic activity, and harsh winters may have erased much of the evidence of the region's past, yet evidence of human presence remains, and cultural resource specialists have identified historic and archeological sites, objects, trails, and places. The monument's entire land base was systematically surveyed following the 1992 Rainbow Fire; therefore, the potential for undiscovered cultural resources within the monument is low.

Section 106 of the National Historic Preservation Act of 1966, as amended (54 USC 306108), requires that all federal agencies take into account the effects of their actions on cultural resources that are eligible for or listed in the National Register of Historic Places (i.e., historic properties) and also requires that federal agencies provide the California State Historic Preservation Officer (SHPO) an opportunity to comment on projects.

Archeological Resources

Archeological evidence suggests that people have been present in the Devils Postpile and surrounding area, crossing the Sierra crest west of present-day Mammoth Lakes, as far back as 7,500 years ago. Obsidian found in the monument suggests that tribes to the east used the valley and west sides of the Sierra seasonally, likely as part of a trade route.

The post-Rainbow Fire survey surveyed the entire monument and documented 12 sites, both prehistoric and historic, including cabin remains, trash scatters, tree blazes, prehistoric and historic trail routes, gathering and hunting areas, and lithic artifacts. Two condition assessments examining the monument's archeological resources have been completed in 2007 and 2013. The 2011 windstorm appears to have impacted some trees with blazes. Other sites have been affected by illegal campfires, fires from improper cigarette disposal, and improper refuse disposal. The small human-caused wildfires near the Cabin site were quickly extinguished by park staff (personal communication with Deanna Dulen, monument superintendent).

Historic Resources

Both the historic Ranger Station and remains of the Postpile Cabin are listed in the National Register of Historic Places for their historic significance. The Ranger Cabin was built in 1941 with lumber salvaged from the former Sentinel Hotel in the Yosemite Valley, replacing a temporary tent shelter that first served as the ranger quarters and visitor contact station beginning in the mid-1930s. Today, this building serves as Ranger Station, the primary contact site for visitors. Despite some changes in materials and workmanship, as the first administrative and oldest standing building in monument, the ranger cabin maintains its unique connection to the early period of NPS planning and development of the Devils Postpile. During its early years, it was a subsidiary of Yosemite National Park. Because of its association

with historic federal land management and interagency cooperation, the Devils Postpile Ranger Cabin was listed in the National Register of Historic Places in 2015 (NPS 2017b, 2017c).

The Devils Postpile Cabin site is both an archeological and historic resource that represents early mining history. Also known as Postpile Joe's Cabin, after Joseph Ivanhoe (a one-armed mule packer), the original chimney and hearth remain of the 1870s cabin, which collapsed from heavy snows in 1954. The Devils Postpile Cabin site was listed in the National Register of Historic Places in 2016 due to its association with events that have made a significant contribution to the broad patterns of history, and because the property has yielded, or is likely to yield, additional important information.

The monument also contains segments of long-distance trails within its boundaries. The Pacific Crest Trail (PCT) incorporates the John Muir Trail to form one alignment through most of the monument. Although it has no formal designation, the 221-mile-long John Muir Trail was constructed between 1915 and 1938, making it one of the oldest trails in the Sierra Nevada (Pacific Crest Trail Association 2018).

The Mammoth Pass Trail also traverses the monument. Serving in the past as a Native American access and trade route connecting tribes on the eastern and western Sierra, the route was also used by early miners and sheepherders moving from the western Sierra near historic Fresno Flats (near today's Oakhurst) to the Reds Meadow Area and to today's Mammoth Lakes region. With the designation of Yosemite National Park in 1890 that included the Middle Fork of the San Joaquin, the U.S. Calvary patrolled routes including this trail. Today, this is a recreational trail within the wilderness. Additionally, the Mammoth Pass Trail may also represent the path taken by Native American groups toward Devils Postpile when they were forcibly removed in the Sierra to make way for European and Euro-American settlement in the mid-1850s (NPS 2015).

Cultural Landscapes

The Mammoth Pass Trail, a historic trail corridor that contains scattered historic materials, could be part of a larger cultural landscape associated with American Indian trans-Sierra trade and the early development of mining in the Mammoth Lakes region. The NPS has submitted a funding proposal to determine eligibility of the trail for a listing on the National Register of Historic Places.

NPS defines a cultural landscape as a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values. The Historic Resource Study completed in 2013 identified potential cultural landscapes including natural features such as the Postpile formation, the Middle Fork San Joaquin River, and Soda Springs in the monument, as well as Reds Meadow in the adjacent INF. A funding proposal has been developed to expand inventory efforts to identify cultural landscapes within the monument.

Ethnographic Resources

Ethnographic resources are valued by traditional societies beyond the scientific information they contain, including prehistoric archeological sites, prehistoric and historically used trails, springs, gathering areas, and sacred places. These landscapes or geographic areas may have had, or may still have, significant meaning to people, and often include plant and animal communities, as well as ceremonial or subsistence grounds as gathering areas (NPS 1994, 2017b).

Today, contemporary local American Indian tribes identify that their relationship between the lands in and around the monument plays an important role in perpetuating cultural ties and spiritual practices. The NPS recognizes that Native American tribes consider specific places containing natural and cultural resources as sacred, having established religious meaning and as locales for private ceremonial activities. The monument, as part of its management strategy, affirms the need to consult with tribal representatives, where applicable, to identify, evaluate, and preserve culturally important sites within Reds Meadow Valley and to address community and tribal interests related to the monument as a whole (NPS 2015,

2017b). During scoping meetings on the FMP with two tribal groups, members identified the need to reduce fire danger, and the desire to have viable employment opportunities.

An Ethnographic Overview and Assessment for the Sierra Nevada Network of Parks, which includes the monument, was initiated in 2015. Anticipated to be completed in 2018, this ongoing effort further cultivates a better understanding of the connections that contemporary, traditionally associated Native American populations have to the monument's ethnographic resources (NPS 2017b).

3.7.2 Environmental Consequences

3.7.2.1 Alternative A: (No Action Alternative) Full Suppression with Limited Fuel Treatments

3.7.2.1.1 ARCHEOLOGICAL RESOURCES

Impacts from Wildfire Suppression

Both known and unidentified archeological sites in the monument would continue to be at risk from unplanned ignitions that could result in loss or damage to these resources, either directly by wildfire and related impacts, or from suppression activities. Suppression of wildfires would attempt to contain ignitions before they are able to gain in size, which would provide immediate protection to archeological resources located outside the fire perimeter.

Wildfire suppression techniques, such as the manual construction of firelines, cutting of vegetation for fuel breaks, and burnout operations, may cause direct impacts to previously unknown archeological sites (including both surface and subsurface cultural materials) due to soil disturbance and compaction. Cultural resource specialists will work with fire management to identify protection strategies for known resources. Mitigation Measures and MIST listed as CUL-1 through CUL-10 (see Appendix D) list practices to be used for fire suppression, locating staging areas, and mop-up activities, and also restrict off-road use of heavy equipment and vehicles without Superintendent approval.

Because the monument has been surveyed in its entirety for cultural resources, the potential for adverse effects on unidentified archeological resources is low. Using mitigation measures (see Appendix D) and READs in fire management decisions would reduce the potential for impact to archeological resources while providing for firefighter and public safety.

However, in the absence of hazardous fuels treatment in the wilderness under the No Action Alternative, existing fuel loads would continue to accumulate, increasing the potential for more intense fire behavior in the event of an unplanned ignition from increased availability of combustible fuel. Combined with terrain and weather conditions, these fires may require greater suppression efforts which could adversely impact archeological resources. Direct impacts from wildfire to archeological resources are functions of the temperature and duration of heating (residence time). Combustion, smoke and ash (combustion byproducts), and heat transfer mechanisms are factors that directly affect archeological resources during wildfire events (Ryan et al. 2012). Longer residence times increase surface and subsurface heating that could damage archeological materials (Ryan and Koerner 2012). As the majority of known archeological sites within the monument contain flaked stone and ground stone artifacts, these direct adverse effects could include breakage, crazing, spalling, and altered hydration (particularly for obsidian) (Deal 2012).

Indirect impacts to archeological resources include post-fire erosion and flooding, carbon contamination in subsurface deposits, and ground disturbance from fire-killed trees that fall (Ryan et al. 2012), as well as other post-fire threats such as looting and vandalism. High-severity fire effects may amplify these post-fire issues. Fire suppression repair and BAER treatment would be implemented to assess impacts to archeological resources and mitigate further threats to these resources.

Unplanned human-caused ignitions do pose a threat to archeological resources, as evidenced by a few small fires at the Postpile Cabin remains site within the last few years. The 1992 Rainbow Fire is evidence that if fire does occur in areas where heavy fuel loading and dense tree stands are present, and considering other environmental factors such as drought conditions, there is the potential for high-intensity fire with severe fire effects that could cause long-term and permanent damage or loss of archeological resources.

Impacts from Prescribed Fire and Pile Burning

Under the No Action Alternative, use of prescribed fire and pile burning would continue only in the non-wilderness portion of the monument. Prior to initiating a prescribed fire, the NPS would develop a prescribed burn plan, which would include coordination with cultural resource staff to identify sensitive cultural locations and protocols for burning near archeological sites. Section 106 compliance would be completed for prescribed burn plans with the California SHPO, and identified cultural resources would be either avoided in the burn unit or prepped prior to the burn in order to mitigate impacts. Preparations might include manually removing fuels on or around the archeological resource; removing heavy logs and fuels from vulnerable areas; and removing or covering stumps with dirt or foam where burnout could affect subsurface cultural deposits. Piles to be burned would not be placed in or near sensitive archeological resources.

All prescribed fire would be carefully managed and implemented using prescribed burn planning, MIST techniques, and oversight by cultural resource advisors. Close monitoring of the prescribed burn would be conducted to avoid adverse impacts to recorded archeological sites. Through adherence to these and other mitigation measures (described in Appendix D), impacts to archeological resources from prescribed fire would be short term and minimal.

By removing surface fuels, dead and downed vegetation, and reducing forest tree density, prescribed fire can reduce the risk of future high-intensity wildfire and the severe fire effects that result. With lower-intensity fire and shorter residence times, surface and subsurface archeological materials may not be subject to higher temperatures and/or longer periods of exposure, thereby reducing surface and subsurface heating. Therefore, prescribed fire and pile burning serve to protect archeological resources that would otherwise be adversely affected by wildfire, but this would only occur in non-wilderness areas under the No Action Alternative. Archeological resources in the wilderness would not be afforded the same protection from fuel load reduction, and these resources would continue to be at risk.

Impacts from Manual Fuels Treatments

Manual fuels treatments would continue to be implemented in the non-wilderness portion of the monument under the No Action Alternative. By reducing fuels and strengthening natural barriers, hand-thinning and other manual treatment methods create defensible space around sensitive resources during suppression efforts or prior to prescribed burning, resulting in beneficial impacts. Manual treatment methods are non-intrusive and have little potential to damage sensitive resources. However, because manual fuels treatment would continue to be used only in the non-wilderness portion of the monument, archeological resources in the wilderness would not be afforded the same protection.

3.7.2.1.2 HISTORIC RESOURCES

Impacts from Wildfire Suppression

Historic buildings and structures tend to be highly fire sensitive, given they are often constructed of combustible materials (e.g., wood). Culturally modified trees, fence lines, and other wood structures are also susceptible to fire damage. For this reason, historic resources—particularly in-use buildings—are often subject to individual treatments ahead of fire activity. Wildfire suppression strategies would be implemented to minimize threats to known historic resources from a fire. Construction of firelines and removal of fuel around the historic resource would help minimize impacts from wildfire. However, these

protection methods may not prevent spot fires from igniting outside the wildfire perimeter, which may still damage these resources even at a distance. Direct impacts from wildfire suppression activities may result from the application of water, if the historic resource is not prepared properly, and if the suppression activities have the potential to damage historic building and structure materials.

Similar to archeological resources, historic resources in the wilderness would be subject to higher severity fire effects from increased fuel loads due to the exclusion of hazardous fuels treatments, impacts of suppression efforts, and mop-up activities under the No Action Alternative. Again, BAER treatments would be implemented to assess impacts and mitigate additional threats to historic resources resulting from high-severity wildfire.

Impacts from Prescribed Fire and Pile Burning

The use of prescribed fire and pile burning would continue to occur only in the non-wilderness portion of the monument and would incorporate pre-planning, including advanced coordination of cultural resource staff with fire management staff to identify these resources and protocols for treatment prior to implementation. Beneficial impacts from increased protection from catastrophic wildfire through the reduction of fuels from prescribed fire and pile burning would be the same as archeological resources. However, this would extend only to historic resources in the non-wilderness portion of the monument under this alternative, and known historic resources in the wilderness would not be afforded the same protection through the reduction of fuel loading, and these resources would continue to be at risk.

Impacts from Manual Fuels Treatments

Like archeological resources, historic resources in the wilderness would not benefit from increased protection through the creation of defensible space and reduced fuel loads through manual fuels treatments.

3.7.2.1.3 CULTURAL LANDSCAPES

Impacts from Wildfire Suppression

In the event an unplanned ignition grows substantially, there is the potential for adverse impacts to potential cultural landscapes from wildfire and from suppression activities as firefighting efforts increase. At risk are yet-to-be identified landscapes and associated components, as well as attributes like viewshed and visual quality that make up cultural landscapes. Fire management actions in the non-wilderness would focus on achieving cultural resource objectives and reduction in fuel loading; however, this would only apply to non-wilderness areas. Important landscape components of the Postpile formation would be considered under proactive management actions, but the same would not be afforded to areas within designated wilderness such as Soda Springs Meadow and the Middle Fork San Joaquin River corridor. Therefore, these strategies could result in relatively less effective prevention of fuel accumulation adjacent to and within potential cultural landscapes in the wilderness, which could lead to an increased potential for wildland fires that would be difficult to suppress or manage and would have greater potential to alter or damage sensitive resources.

Intense unplanned wildfires could result in the alteration of important potential cultural landscape features, resulting in long-term adverse impacts if forested landscapes become unvegetated, or archeological sites and historic buildings and structures are consumed by fire. As the monument has not experienced a high-intensity fire since the 1992 Rainbow Fire, there is the potential for high-intensity fire with severe fire effects, which could cause long-term and permanent damage or loss of important landscape resources.

Impacts from Prescribed Fire and Pile Burning

Under the No Action Alternative, prescribed fire and pile burning would only in the non-wilderness portion of the monument. Pre-planning for prescribed fire and pile burning would include consideration of cultural landscape components, particularly around the Postpile formation, which would include advanced coordination with cultural resource staff to identify these resources and protocols for appropriate treatment.

Increased vegetation density in the absence of active vegetation maintenance would encroach on cultural landscapes and views located in wilderness because no prescribed fire treatment would occur in wilderness under the No Action Alternative. The lack of prescribed fire treatments in the wilderness areas could result in long-term adverse impacts to potential cultural landscapes because increased vegetation density would change the historic character of the views and vistas. Beneficial impacts from enhanced protection from catastrophic wildfire through the reduction of fuels from prescribed fire and pile burning would be the same as other cultural resources. However, these benefits would only occur for landscape resources located in non-wilderness portions of the monument under the No Action Alternative. Therefore, known cultural landscapes in wilderness, and the important natural and cultural components they contain, would not be subject to the same preventive measures or the same level of protection through proactive vegetation management and would continue to be at risk under this alternative.

Impacts from Manual Fuels Treatments

Like other cultural resources, cultural landscapes in the wilderness would not benefit from increased protection through the creation of defensible space and reduced fuel loads through manual fuels treatments.

3.7.2.1.4 ETHNOGRAPHIC RESOURCES

Impacts from Wildfire Suppression

Under the No Action Alternative, fire management activities would continue to be limited to suppression activities only throughout the monument. Wildfires and fire management actions could disturb, destroy, or alter resources important to traditionally associated tribal groups, including plant communities, prehistoric archeological sites, prehistoric and historically used trails, springs, and sacred places. As ethnographic resources include archeological and historic components, loss, damage, and other impacts to these resources would result in impacts to ethnographic resources as well.

Importantly, as consultation efforts have revealed, access to lands and the reduction of fire danger are key issues important to tribal groups traditionally associated with the area of the monument. Consultation and coordination with tribal groups would continue under existing management to share knowledge about important ethnographic resources and to solicit tribal perspectives on their management and protection in the event of wildfire.

Impacts from Prescribed Fire and Pile Burning

The process of pre-planning for prescribed fire and pile burning would include consideration of ethnographic resources and tribal concerns. Like other cultural resources described above, beneficial impacts from enhanced protection from catastrophic wildfire through the reduction of fuels from prescribed fire and pile burning would be the same for ethnographic resources. However, these benefits would only occur for those resources located in non-wilderness portions of the monument under the No Action Alternative. Therefore, ethnographic resources in wilderness would not be subject to the same preventive measures or the same level of protection through proactive vegetation management and would continue to be at risk under this alternative.

Impacts from Manual Fuels Treatments

Like archeological resources and historic resources in the wilderness, potential cultural landscapes would not benefit from increased protection through the creation of defensible space and reduced fuel loads through manual fuels treatments.

3.7.2.1.5 CUMULATIVE IMPACTS

The geographic extent for the analysis of cumulative impacts on cultural resources is encompassed by the monument boundary. The temporal scope of cumulative impacts on cultural resources would depend on the duration of activities, which could range from several days up to several years for fire management activities that have long-term effects. For the purposes of this analysis, the temporal extent of cumulative impacts to cultural resources is 25 years (the average fire cycle [see Vegetation affected environment above in Section 3.3]) to account for cumulative effects on cultural landscapes (vegetation).

Cumulative impacts to cultural resources under the No Action Alternative would occur largely where ground-disturbing activities (including wildfire and/or fire management) occur simultaneously with other actions within the monument or in the adjacent INF that affect monument resources (such as a wildfire that encroaches into the monument, or actions that are managed jointly between NPS and the INF). These impacts would also include increased probability of effects from suppression activities through attempts to keep fire size as small as possible during wildfire suppression operations, as well as increased fuel accumulation resulting from the inability to manage wildfire for multiple objectives under conditions conducive for doing so. Restricting fuels treatments to non-wilderness areas would leave cultural resources in wilderness more vulnerable to the effects of fire and post-fire conditions. Additionally, interagency management actions that result in increasing visitor traffic through infrastructure improvement (roads, shuttles, trails, visitor facilities), may result in cumulative adverse impacts to cultural resources by potentially increasing the degree of human disturbance in areas where such resources are present.

Past and present actions have been subject to evaluation under Section 106 of the National Historic Preservation Act to consider effects on cultural resources from projects, and future actions would undergo the same process required of all federal actions. Through this process, impacts to cultural resources would either be avoided or, where impacts are unavoidable, effects would be mitigated through appropriate treatment, which would be developed in consultation with California SHPO and Native American tribes with traditional associations to the monument. Because the monument has been surveyed in its entirety for cultural resources, the likelihood of an unanticipated discovery is low. Therefore, there would be no cumulative adverse impacts to cultural resources in Devils Postpile National Monument under the No Action Alternative from planned actions by NPS and other entities.

Past inventories and studies, and current assessments, have further enhanced knowledge of the monument's cultural resources and facilitated better documentation efforts for management strategy development. Future beneficial long-term impacts would occur to cultural resources resulting from continued protection and preservation efforts for archeological and historic resources, proposed public interpretation opportunities at the Devils Postpile Cabin site, as well as the planned inventory and documentation for potential cultural landscapes. Finally, cultural resources would continue to benefit from ongoing consultation efforts with traditionally associated tribal groups, and the completion of the Ethnographic Overview and Assessment.

3.7.2.2 *Alternative B: Targeted Suppression with Limited Managed Wildfire and Monument-wide Fuels Treatments (Preferred Alternative)*

3.7.2.2.1 ARCHEOLOGICAL RESOURCES

Impacts from Wildfire Suppression and Wildfire for Multiple Objectives

Wildland fire suppression impacts to archeological resources under the Preferred Alternative would be the same as the No Action Alternative; however, the designation of the Wildfire Restoration Zone would allow hazardous fuels treatments to occur within the wilderness, thereby lowering the potential for severe fire effects from an unplanned ignition. Additionally, the ability to manage naturally ignited wildfire for multiple objectives, including resource benefits, could be implemented throughout the monument, particularly in the wilderness area.

There is the potential of impacts to yet-to-be discovered archeological sites in areas where wildfires burn vegetation, however, because the entire monument was surveyed for cultural resources after the 1992 Rainbow Fire, the likelihood of inadvertent discovery is low. Additionally, fire can be helpful in uncovering previously undiscovered resources due to removal of vegetation. To protect archeological resources, the NPS would have the option of suppressing fires near known archeological sites or reducing fuels at the site while allowing wildfires to burn. The use of wildfire could also result in long-term beneficial impacts to archeological resources by reducing hazardous fuels, which would reduce the potential for loss of or damage to sites from future fire events. Subsequently, lower-intensity wildfire would require less intense and potentially damaging suppression actions, which would result in fewer adverse impacts to archeological resources, compared with the No Action Alternative.

Impacts from Prescribed Fire and Pile Burning

Under the Preferred Alternative, prescribed fire and pile burns would occur in both wilderness and non-wilderness areas of the monument. Impacts to archeological resources from prescribed fire and pile burns would be largely the same as those described under the No Action Alternative, though more acreage could be treated by prescribed fire. Reducing fuel loading under Alternative B would provide increased protections to surface and subsurface archeological resources that would otherwise be subject to fires with longer flame residence times and significant surface and subsurface heating.

Impacts from Manual Fuels Treatments

The Preferred Alternative would allow manual fuels treatments to occur in both wilderness and non-wilderness areas. Impacts to archeological resources from manual fuels treatments would be largely the same as those described under the No Action Alternative. Manual treatments in the wilderness would focus on concentrating fuel load reduction in preparation for prescribed fire events conforming to mitigation measure CUL-10 and in support of wildfire managed for multiple objectives. Combined, these efforts would reduce hazardous fuels and the risk of catastrophic fire, enhancing protection of archeological resources throughout the monument.

3.7.2.2.2 HISTORIC RESOURCES

Impacts from Wildfire Suppression and Wildfire for Multiple Objectives

The impacts to historic resources from wildfire suppression under the Preferred Alternative would be the same as described under archeological resources above.

Impacts from Prescribed Fire and Pile Burning

The impacts to historic resources from prescribed fire and pile burning under the Preferred Alternative would be the same as described under archeological resources above.

Impacts from Manual Fuels Treatments

The impacts to historic resources from manual fuels treatments under the Preferred Alternative would be the same as described under archeological resources above.

3.7.2.2.3 CULTURAL LANDSCAPES

Impacts from Wildfire Suppression and Wildfire for Multiple Objectives

Wildland fire suppression impacts to potential cultural landscapes under the Preferred Alternative would be the same as under the No Action Alternative; however, prescribed burns and manual treatments would be used as proactive vegetation management tools in a larger portion of the monument under the Preferred Alternative. Therefore, these proactive vegetation management tools would reduce the risk of wildfire and wildfire suppression impacts to potential cultural landscapes in both wilderness and non-wilderness.

The use of wildfire for multiple objectives would increase the ability and efficiency to reduce vegetation density and ground cover, increasing the reduction of hazardous fuels and success rate of ecological restoration efforts for fire-adapted and other unique habitats. This would increase the potential for lower-intensity ground fires, which are easier to manage, thus reducing the potential risk of damage to potential cultural landscapes. These lower-intensity ground fires would help maintain historic viewsheds, including Soda Springs Meadow and along the Middle Fork San Joaquin River in wilderness. In addition, the fire management activities in this alternative would be planned and designed to achieve cultural landscape objectives.

Impacts to potential cultural landscapes under this alternative would be long term and beneficial in both wilderness and non-wilderness areas due to minimizing the potential for future severe wildland fires as the number of acres restored increases and fuel density decreases. Short-term adverse impacts would include unsightly burned and scorched vegetation and unvegetated areas from both prescribed burns and more intense unplanned managed fires. Removal of vegetation through the use of wildland fire for multiple objectives would have short-term minor impacts on cultural landscapes, which would lessen as vegetation would be reestablished over time (the length of time would depend on vegetation type).

Impacts from Prescribed Fire and Pile Burning

Under the Preferred Alternative, prescribed fire and pile burns could be undertaken throughout the monument. Impacts to potential cultural landscapes from prescribed fire and pile burning would be the same as those described under the No Action Alternative, though in a larger area. Prescribed burning, combined with pre-treatment through hand-thinning, would be used to reduce the risk of brush and tree establishment and enhance cultural resources important to potential cultural landscapes (e.g., maintaining open fields, improving and creating defensible space around structures) and visual aesthetics, thus enhancing protection by decreasing the probability of severe wildfires. The long-term impacts of the Preferred Alternative on cultural landscapes throughout the monument would be beneficial because the treatments would help restore and maintain both natural and cultural components that contribute to the importance of these landscapes.

Impacts from Manual Fuels Treatments

The Preferred Alternative would allow manual fuels treatments to occur in both wilderness and non-wilderness areas. Impacts to cultural landscapes from manual fuels treatments would be largely the same as those described under the No Action Alternative, though in a larger area. By reducing fuels and strengthening natural barriers, hand-thinning and other manual treatment methods create defensible space around archeological and historic resources, resulting in beneficial impacts to cultural landscapes through enhanced protection of important landscape components. Because manual treatment does not include use of mechanical equipment, these methods tend to be less intrusive and damaging to sensitive resources. Manual fuels treatment under this alternative would beneficially impact cultural landscapes within the

monument because trimming and removing vegetation would protect defensible space around structures and restore historic views.

3.7.2.2.4 ETHNOGRAPHIC RESOURCES

Impacts from Wildfire Suppression and Wildfire for Multiple Objectives

Wildfire suppression impacts to ethnographic resources under the Preferred Alternative would be the same as under the No Action Alternative, though in a larger area. Therefore, these proactive vegetation management tools would reduce the risk of wildfire and wildfire suppression impacts to cultural landscapes in both wilderness and non-wilderness. The use of wildfire for multiple objectives would facilitate the success rate of ecological restoration efforts for fire-adapted environments, thereby encouraging lower-intensity ground fires that are easier to manage and overall reduce the risk of damage to natural and cultural resources important to tribal groups in the monument. These lower-intensity wildfires would help restore a more resilient landscape and promote ecosystem health. In addition, the fire management activities implemented under this alternative would be planned and designed to achieve resource objectives that would include preservation and protection of ethnographic resources.

Impacts to ethnographic resources under this alternative would be long term and overall beneficial due to minimizing the potential for future, high-intensity wildfires as the number of acres restored would increase as fuel density decreases. Short-term adverse impacts could include burned vegetation, potentially including the loss of traditional plant communities from both prescribed burns and more intense managed wildland fires. As with cultural landscapes, the adverse impacts to vegetation would be expected to last one or two growing seasons, depending on the intensity of the fire event.

Impacts from Prescribed Fire and Pile Burning

Impacts to ethnographic resources under the Preferred Alternative from prescribed fire and pile burning would be the same as those described under the No Action Alternative, though in a larger area. As with potential cultural landscapes, prescribed burning, combined with pre-treatment hand-thinning, would reduce the risk of vegetation establishment and enhance the quality of natural resources and the preservation of cultural resources important to tribal values, thus enhancing protection by decreasing the probability of severe wildland fires in the future.

Impacts from Manual Fuels Treatments

The Preferred Alternative would allow manual fuels treatments to occur in both wilderness and non-wilderness areas. Impacts to ethnographic resources from manual fuels treatments would be largely the same as those described under the No Action Alternative, though in a larger area. Cultural and natural resources important to tribal values would benefit from hazardous fuels reduction throughout the monument from implementation of the Preferred Alternative, and impacts to ethnographic resources would be the same as those described above for other cultural resources.

3.7.2.2.5 CUMULATIVE IMPACTS

Cumulative impacts to cultural resources resulting from implementation of the Preferred Alternative would include the entire monument and be similar to those described under the No Action Alternative above.

3.7.2.3 Conclusion

Under both alternatives, cultural resources in the monument would be at risk from unplanned ignitions that could result in loss or damage to these resources, either directly or indirectly by wildfire, or from suppression and/or mop-up activities; however, because the monument has been surveyed in its entirety, the risk of adverse effects on unidentified cultural resources is low. In the event of a wildland fire, measures would be taken to prevent and/or minimize damage to all cultural resources within the

monument, and all fire suppression and mop-up operations would be performed using MIST guidelines. For planned ignitions, all prescribed burn activities would be carefully managed under a prescribed burn plan, which would include coordination with cultural resource staff to identify sensitive cultural resource areas to avoid or treat to mitigate impacts (Mitigation Measures CUL-10). Section 106 consultation would be the primary regulatory mechanism to address impacts to cultural resources in the monument in both emergency (wildlife, BAER) and non-emergency (planned treatment) situations.

The main difference between the No Action Alternative (Alternative A) and the Preferred Alternative (Alternative B) is the number of acres subject to hazardous fuels treatment. Because 687 acres of wilderness would be included under the Preferred Alternative, more acres would be able to be treated through proactive fire management, which would afford better protection to cultural resources by reducing fuel load throughout the monument, not just in the non-wilderness area. Additionally, the ability to manage naturally ignited wildfire for multiple objectives, including resource benefits, would also be implemented throughout the monument under the Preferred Alternative. The introduction of hazardous fuels treatments in wilderness and the use of wildfire for multiple objectives would reduce the risk of catastrophic fire throughout the monument, resulting in potentially fewer impacts to cultural resources either directly and/or indirectly from wildfire (due to lower fire intensity/severity) as well as from wildfire-suppression activities that would otherwise be needed to fight catastrophic fire. Therefore, the Preferred Alternative would result in long-term beneficial impacts to all of the monument's cultural resources in both wilderness and non-wilderness areas.

3.8 CONTRIBUTORS AND PERSONS CONSULTED

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APPENDIX A: LITERATURE CITED

- Alphandary, E. 2016. Lichen survey of Devils Postpile National Monument.
- Ammann, H., R. Blaisdell, M. Lipsett, S.L. Stone, and S. Therriault. 2001. *Wildfire Smoke: A Guide for Public Health Officials*. Available at: <http://www.arb.ca.gov/smp/progdev/pubeduc/wfgv8.pdf>. Accessed May 20, 2015.
- Arnett, M., and S. Haultain. 2005. *Vascular plants of Devils Postpile National Monument, Madera County, California*. Final report to Sierra Nevada Network Inventory & Monitoring Program, Three Rivers, California.
- Arnett, M., A.M. Huber, K.M. Stevenson, and S. Haultain. 2014. Vascular flora of Devils Postpile National Monument, Madera County, California. *Madroño* 61(4):367–387.
- Balch, J.K., Bradley, B.A., D’Antonio, C.M. and Gomez-Dans, J. 2013. Introduced annual grass increases regional fire activity across the arid western USA (1980-2009). *Global Change Biology* 19(1):173–183.
- Buhler, M. 2018. Personal communication, M. Buhler, Natural Resource Program Manager, Devils Postpile National Monument, with Adrian Hogel, NEPA Planner, SWCA Environmental Consultants, July 4, 2018.
- Burley, J., A.J. Bytnerowicz, M. Buhler, B. Zielinska, D. Schweizer, R. Cisneros, S. Schilling, J. Chapman Varela, M. McDaniel, M. Horn, and D. Dulen. 2016. Air Quality at Devils Postpile National Monument, Sierra Nevada Mountains, California, USA. *Aerosol and Air Quality Research* 16: 2315–2332.
- Bytnerowicz, A., J.D. Burley, R. Cisneros, H.K. Preisler, S. Schilling, D. Schweizer, J. Ray, D. Dulen, C. Beck, and D. Auble. 2013. Surface ozone at Devils Postpile National Monument receptor site during high and low wildland fire years. *Atmospheric Environment* 65(2013):129–141.
- California Air Resources Board. 2003. Air Quality and the Wildland Fires of Southern California October, 2003. A preliminary review of particulate matter, air toxics, and carbon monoxide. Available at: https://www.arb.ca.gov/research/chs/fire/report_revised_Sept2010.pdf. Accessed May 9, 2018.
- Caprio, A.C. 2004. Temporal and spatial dynamics of pre-Euroamerican fire at a watershed scale, Sequoia and Kings Canyon National Parks. In *Proceedings of the Conference on Fire Management: Emerging Policies and New Paradigms*. San Diego, California, Nov. 16–19, 1999.
- . 2006. Fire history in the lodgepole pine in the southern Sierra Nevada, California. Extended abstract. In *Association for Fire Ecology 3rd International Fire Ecology Congress*.
- Caprio, A.C., M. Keifer, and K. Webster. 2006. *Long-term Effects of the 1992 Rainbow Fire, Devils Postpile National Monument, California*. Association for Fire Ecology. 3rd International Fire Ecology Congress, San Diego, California.
- Caprio, A.C., and T.W. Swetnam. 1995. Historic fire regimes along an elevational gradient on the west slope of the Sierra Nevada, California. In *Proceedings: Symposium on Fire in Wilderness and Park Management, Technical Coordination*, coordinated by J.K. Brown, R.W. Mutch, C.W. Spoon, and R.H. Wakimoto, pp. 173–179. General Technical Report INT- GTR- 320. Ogden, Utah: U.S. Forest Service, Intermountain Research Station.
- Caprio, A.C., and K. Webster. 2006. *Fire Effects Monitoring on the 1992 Rainbow Fire, Devils Postpile National Monument: Vegetation Response Ten Years Postfire*. Three Rivers, California: Division of Natural Resources, Sequoia and Kings National Parks.
- Cisneros, R., A. Bytnerowicz, D. Schweizer, S. Zhong, S. Traina, T. Procter, and D. Bennett. 2010. Ozone, nitric acid and ammonia air pollution unhealthy for people and ecosystems in southern Sierra Nevada, California. *Environmental Pollution* 158:3261–3271.

- Cisneros, R., D. Schweizer, H. Preisler, D. Bennet, G. Shaw, and A. Bytnerowicz. 2014. Spatial and seasonal patterns of particulate matter less than 2.5 microns in the Sierra Nevada Mountains, California. Accessed: July 5, 2018. Available at: <https://www.sciencedirect.com/science/article/pii/S130910421530266X?via%3Dihub>
- Chang, C. 1996. Ecosystem Responses to Fire and Variations in Fire Regimes. In *Sierra Nevada Ecosystem Project: Final Report to Congress*, vol. II, chap. 39. Davis: University of California, Centers for Water and Wildland Resources.
- Deal, K. 2012. Chapter 4: Fire Effects on Flaked Stone, Ground Stone, and Other Stone Artifacts. In *The Rainbow Series, Vol. 3: Wildland Fire in Ecosystems—Effects of Fire on Cultural Resources and Archaeology*, edited by K.C. Ryan, T. Jones, C.L. Koerner, and K.M. Lee, pp. 97–111. General Technical Report RMRS-GTR-42. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Denn, M., and D. Shorrock. 2009. *Devils Postpile National Monument Wetland Inventory and Conditions Assessment*. Washington, D.C.: U.S. National Park Service, Water Resources Division.
- Dulen, D. 2012. Special Status Vascular Plant Species in the monument. National Park Service Memorandum. August 11, 2012.
- Floyd, T.M., K.R. Russell, C.E. Moorman, D.H. van Lear, D.C. Guynn, Jr., and J.D. Lanham. 2002. Effects of Prescribed Fire on Herpetofauna Within Hardwood Forests of the Upper Piedmont of South Carolina: A Preliminary Analysis. In General Technical Report SRS-48, pg. 123–127. Asheville, North Carolina: U.S. Department of Agriculture, Forest Service, Southern Research Station.
- Formichelli, C., K. Fristrup, D. Joyce, E. Lynch, and E. Pilcher. 2007. *Devils Postpile National Monument Acoustic Monitoring Report, 2005-2006*. Fort Collins, Colorado: National Park Service Natural Sounds Program.
- Hardy, C.C., R.D. Ottmar, J.L. Peterson, J.E. Core, and P. Seamon. 2001. *Smoke Management Guide for Prescribed and Wildland Fire*: 2001 edition. PMS 420-2. NFES 1279. Boise, Idaho: National Wildfire Coordination Group.
- Heath, S.K. 2007. Avian Demography Monitoring and Visitor Education at Devils Postpile National Monument, 2002–2006. PRBO Contribution #1552. Petaluma, California: PRBO Conservation Science.
- Hickman, J.C. 1993. *The Jepson Manual: Higher Plants of California*. Berkeley: University of California Press.
- Hilimire, K., J.C.B. Neismith, A. Caprio, and R. Milne. 2013. Attributes of Windthrown Trees in a Sierra Nevada Mixed-Conifer Forest. *Western Journal of Applied Forestry* 28(2). Available at: <https://irma.nps.gov/DataStore/DownloadFile/471059>. Accessed July 23, 2018.
- Holmgren, A.L., R.L. Wilkerson, and R.B. Siegel. 2012. *Sierra Nevada Network Bird Monitoring: 2011 Annual Report*. Natural Resource Data Series NPS/SIEN/NRDS—2012/362. Fort Collins, Colorado: National Park Service.
- Holmquist, J.G., and J. Schmidt-Gengenbach. 2005. *Inventory of Invertebrate Fauna in Devils Postpile National Monument: Final Report*. Bishop, California: White Mountain Research Station.
- Keeler-Wolf, T., P.E. Moore, E.T. Reyes, J.M. Menke, D.N. Johnson, and D.L. Karavidas. 2012. *Yosemite National Park Vegetation Classification and Mapping Project Report*. Natural Resource Technical Report NPS/YOSE/NRTR—2012/598. Fort Collins, Colorado: National Park Service.
- Keeley, J.E., G.H. Aplet, N.L. Christensen, S.G. Conrad, E.A. Johnson, P.N. Omi, D.L. Peterson, and T.W. Swetnam. 2009. *Ecological Foundations for Fire Management in North American Forest and Shrubland Ecosystems*. General Technical Report PNW-GTR-779. Portland, Oregon: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Knapp, E.E., B.L. Estes, and C.N. Skinner. 2009. *Ecological Effects of Prescribed Fire Season: A Literature Review and Synthesis for Managers*. General Technical Report PSW-GTR-224. Albany, California: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station.

- Kuhn, B.A., and T. Whitaker. 2014. *Natural Resource Condition Assessment for Devils Postpile National Monument*. Natural Resource Report NPS/DEPO/NRR—2014/889. Fort Collins, Colorado: National Park Service.
- Landres, P., C. Barns, J.G. Dennis, T. Devine, P. Geissler, C.S. McCasland, L. Merigliano, J. Seastrand, and R. Swain. 2008. Keeping It Wild: An Interagency Strategy to Monitor Trends in Wilderness Character across the National Wilderness Preservation System. General Technical Report RMRS-GTR-212. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Marshall, A., L. Waller, and Y. Lekberg. Cascading effects of fire retardant on plant-microbe interactions, community composition, and invasion. *Ecological Applications*, 26(4). Ecological Society of America.
- McKelvey, K.S., C.N. Skinner, C. Chang, D.C. Et-man, S.J. Husari, D.J. Parsons, J.W. van Wagtendonk, and C.P. Weatherspoon. 1996. *An Overview of Fire in the Sierra Nevada*. Chapter 37 in *The Sierra Nevada Ecosystem Project: Final report to Congress*, vol. II, *Assessments and Scientific Basis for Management Options*. Davis: University of California, Centers for Water and Wildland Resources. Available at: <https://www.fs.fed.us/psw/publications/mckelvey/mckelvey2.PDF>. Accessed July 23, 2018.
- Moritz, C., J.L. Patton, C.J. Conroy, A. Leache, A. Rush, and S.R. Beissinger. 2011. *A Re-Survey of the Grinnell-Storer Vertebrate Transect through Yosemite National Park, California*. Natural Resource Technical Report NPS/SIEN/NRTR—2011/439. Fort Collins, Colorado: National Park Service, Natural Resource Program Center.
- Mortiz, C., J.L. Patton, C.J. Conroy, G.C. White, G.R. Beissinger, and J.L. Parra. 2008. Impact of a century of climate change on small-mammal communities in Yosemite National Park, USA. *Science* 322(5899):261–264.
- National Interagency Fire Center. 2009. *Guidance for Implementation of Federal Wildland Fire Management Policy*. Boise, Idaho: National Interagency Fire Center. Available at: https://www.nifc.gov/policies/policies_documents/GIFWFMP.pdf. May 5, 2018.
- National Oceanic and Atmospheric Administration (NOAA). 2018. NOAA's Severe Weather Data Inventory. Available at: <https://www.ncdc.noaa.gov/swdi/#TileSearch>. Accessed July 9, 2018.
- National Park Service (NPS). 1994. *Preservation Brief No. 36—Protecting Cultural Landscapes: Planning, Treatment, and Management of Historic Landscapes*. Washington, D.C.: U.S. Department of the Interior, National Park Service, Cultural Resources, Preservation Assistance Division.
- . 2003. *Fire Monitoring Handbook*. National Interagency Fire Center, Boise, ID. 274 p.
- . 2005. *Devils Postpile National Monument Fire and Fuels Management Plan*. Available at: <https://irma.nps.gov/DataStore/DownloadFile/152688>. Accessed May 5, 2018.
- . 2008. Director's Order #18: Wildland Fire Management. Available at: https://www.nps.gov/policy/DOrders/DO_18.pdf. Accessed July 10, 2018.
- . 2014. *Reference Manual 18, Wildland Fire Management (RM-18)*. Washington, D.C.: National Park Service, Division of Fire and Aviation.
- . 2015. *Devils Postpile National Monument General Management Plan*. Mammoth Lakes, California: U.S. Department of the Interior, National Park Service, Devils Postpile National Monument.
- . 2016. State of the Park Report for Devils Postpile National Monument. State of the Park Series No. 26. Washington, D.C.: National Park Service. Available at: <https://home1.nps.gov/stateoftheparks/depo/>. Accessed July 23, 2018.
- . 2017a. *Devils Postpile National Monument*. Foundation document. Available on file with NPS.
- . 2017b. *Devils Postpile National Monument Resource Stewardship Strategy*. Mammoth Lakes, California: U.S. Department of the Interior, National Park Service, Devils Postpile National Monument.

- . 2017c. State of the Park Report for Devils Postpile National Monument: Resource Brief—Historic Ranger’s Cabin. Available at: <https://www.nps.gov/stateoftheparks/depo/culturalresources/rangerscabin.cfm>. Accessed July 10, 2018.
- . 2017d. State of the Park Report for Devils Postpile National Monument: Resource Brief—Historic Devils Postpile Cabin Remains. Available at: <https://www.nps.gov/stateoftheparks/depo/culturalresources/cabin.cfm>. Accessed July 10, 2018.
- . 2018. Biological Assessment Devils Postpile National Monument Fire Management Plan Update. Madera County, California. April 12, 2018.
- National Wildfire Coordinating Group (NWCG). 2012. Glossary of Wildland Fire Terminology. Available at: http://www.nwcg.gov/glossary/a-z#letter_m. Accessed April 11, 2018.
- . 2017a. Interagency Prescribed Fire Planning and Implementation Procedures Guide, PMS 484. Boise, Idaho.
- . 2017b. *National Incident Management System: Wildland Fire Qualification System Guide*. PMS 210. Boise, Idaho. Available at: <https://www.nwcg.gov/sites/default/files/publications/pms310-1.pdf>. Accessed May 15, 2018.
- Neary, D.G., K.C. Ryan, and L.F. DeBano (eds). 2008. *Wildland Fire in Ecosystems: Effects of Fire on Soil and Water*. General Technical Report RMRS-GTR-42-volume 4. Rev. ed. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Available at: https://www.fs.fed.us/rm/pubs/rmrs_gtr042_4.pdf. May 10, 2018.
- Pacific Crest Trail Association. 2018. JMT history. Available at: <https://www.pcta.org/discover-the-trail/john-muir-trail/jmt-history/>. Accessed April 26, 2018.
- Patton, J.L., and L. Chow. 2015. Final Report on Mammalian Diversity in Devils Postpile National Monument. National Park Service Report.
- Perry, R.W. 2011. *Proceedings of the 4th Fire in Eastern Oak Forests Conference. 2011 May 17-19; Springfield, MO*. General Technical Report NRS-P-102. Hot Springs, Arkansas: U.S. Department of Agriculture, Forest Service, Southern Research Station.
- Pierson, E.D., and W.E. Rainey. 2009. *Bat Inventory for Sequoia and Kings Canyon National Parks and Devils Postpile National Monument*. Report to Sierra Nevada Network Inventory and Monitoring Program.
- Richardson, T.W., and S.K. Heath. 2004. Effects of conifers on aspen-breeding bird communities in the Sierra Nevada. *Transactions of the Western Section of the Wildlife Society* 40:68–81.
- Rinne, J.N., and G. Jacoby. 2005. Aquatic biota, fishes, invertebrates. In *Wildland Fire in Ecosystems: Effects of Fire on Soils and Water* (revised 2008), edited by D.G. Neary, K.C. Ryan, and L.F. DeBano, pp. 135–143. General Technical Report RMRS-GTR-42-vol.4. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Ryan, K.C., and C.L. Koerner. 2012. Chapter 2: Fire Behavior and Effects—Principles for Archaeologists. In *The Rainbow Series, Vol. 3: Wildland Fire in Ecosystems—Effects of Fire on Cultural Resources and Archaeology*, edited by K.C. Ryan, A.T. Jones, C.L. Koerner, and K.M. Lee, pp. 15–55. General Technical Report RMRS-GTR-42. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Ryan, K.C., C.L. Koerner, K.M. Lee, and N. Siefkin. 2012. Chapter 1: Effects of Fire on Cultural Resources—Introduction. In *The Rainbow Series, Vol. 3: Wildland Fire in Ecosystems—Effects of Fire on Cultural Resources and Archaeology*, edited by K.C. Ryan, A.T. Jones, C.L. Koerner, and K.M. Lee, pp. 1–14. General Technical Report RMRS-GTR-42. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Sandberg, D.V., R.D. Ottmar, J.L. Peterson, and J. Core. 2002. *Wildland Fire on Ecosystems: Effects of Fire on Air*. General Technical Report RMRS-GTR-42-vol. 5. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

- Schroeter, R.E., and J.M. Harrington. 1995. Benthic Macroinvertebrate Community Assessment of the Middle Fork San Joaquin River, Madera County, California. Fishery and Riparian Resources of Devils Postpile National Monument and Surrounding Waters. Rancho Cordova, California: California Department of Fish and Game, Water Pollution Control Laboratory.
- Siegel, R.B., and R.L. Wilkerson. 2004. *Landbird Inventory for Devils Postpile National Monument*. Final Report. IBP Contribution No. 239. Point Reyes Station, California: The Institute for Bird Populations.
- Siegel, R.B., R.L. Wilkerson, and M. Goldin Rose. 2010. *Bird Monitoring Protocol for National Parks in the Sierra Nevada Network*. Natural Resource Report NPS/SIEN/NRR—2010/231. Fort Collins, Colorado: National Park Service.
- Steel, Z.L., M.L. Bond, R.B. Siegel, and P. Pyle. 2012a. Avifauna of Sierra Nevada Network Parks: Assessing Distribution, Abundance, Stressors, and Conservation Opportunities for 145 Bird Species. Natural Resource Report NPS/SIEN/NRR—2012/506. Fort Collins, Colorado: National Park Service.
- . 2012b. Appendix A – Species Accounts. In *Avifauna of Sierra Nevada Network Parks: Assessing Distribution, Abundance, Stressors, and Conservation Opportunities for 145 Bird Species*. Natural Resource Report NPS/SIEN/NRR—2012/506.A. Fort Collins, Colorado: National Park Service.
- Stephens, S.L., J.K. Agee, P.Z. Fulé, M.P. North, W.H. Romme, T.W. Swetnam, and M.G. Turner. 2013. Managing forests and fire in changing climates. *Science* 342(6154):41–42.
- Swetnam, T.W., C.H. Baisan, K. Morino, and A.C. Caprio. 1998. *Fire History Along Elevational Transects in the Sierra Nevada, California*. Final Report to Sierra Nevada Global Change Research Program, USGS BRD Sequoia and Kings Canyon, and Yosemite Field Stations. On file, Sequoia and Kings Canyon National Parks.
- U.S. Department of the Interior and U.S. Department of Agriculture. 2018. *Interagency Standards for Fire and Fire Aviation Operations Manual*. Boise, Idaho: National Interagency Fire Center, Interagency Standards for Fire and Fire Aviation Operations Group. Available at: https://www.nifc.gov/policies/pol_ref_redbook.html. May 10, 2018.
- U.S. Forest Service. 2007. Wildland Fire Chemical Clean-Up Factsheet. Dated: July 12, 2007. Available at: <https://www.fs.fed.us/rm/fire/wfcs/documents/cleanup.pdf>. Accessed July 1, 2018.
- . 2017. Ecological Risk Assessment of Wildland Fire-Fighting Chemicals: Long-term Fire Retardants. Prepared for Fire and Aviation Management, U.S. Forest Service. September.
- Webster, K.M., and C.B. Halpern. 2010. Long-term vegetation responses to reintroduction and repeated use of fire in mixed-conifer forests of the Sierra Nevada. *Ecosphere* 1(5), November 2010.
- Werner, H.W. 2004. *Vertebrate Survey for Sequoia and Kings Canyon National Parks and Devils Postpile National Monument*. Final report to Sierra Nevada Network Inventory and Monitoring Program. Three Rivers, California.
- Westerling, A.L., H.G. Hidalgo, D.R. Cayan, and T.W. Swetnam. 2006. Warming and earlier spring increase western U.S. forest wildfire activity. *Science* 313(5789):940–943.
- Zald, H.S.J., A.N. Gray, M. North, and R.A. Kern. 2008. Initial tree regeneration responses to fire and thinning treatments in a Sierra Nevada mixed-conifer forest, USA. *Forest Ecology and Management* 256(2008):168–179.

APPENDIX B: ACRONYMS AND ABBREVIATIONS

Air District	San Joaquin Valley Air Pollution Control District
AQRV	air quality related value
BACM	Best Available Control Measures
BAER	Burned Area Emergency Response
BAR	Burned Area Rehabilitation
BMP	Best Management Practice
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DO	Director's Order
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
ES	Emergency Stabilization
FMP	Fire Management Plan
FONSI	Finding of No Significant Impact
GMP	General Management Plan
INF	Inyo National Forest
MIST	Minimum Impact Strategies and Tactics
monument	Devils Postpile National Monument
mph	miles per hour
MRA	Minimum Requirements Analysis
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO ₂	nitrogen dioxide
NO _x	nitrogen oxide(s)
NPS	National Park Service
NWCG	National Wildfire Coordinating Group
O ₃	ozone
Pb	lead
PCT	Pacific Crest National Scenic Trail
PFIRS	Prescribed Fire Information Reporting System
PM ₁₀	particulate matter less than 10 microns in size
PM _{2.5}	particulate matter less than 2.5 microns in size
PMS	Product Management System
READs	Resource Advisors
RM	Reference Manual
RSS	Resource Stewardship Strategy
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO ₂	sulfur dioxide
USC	United States Code
VOC	volatile organic compound
WFDSS	Wildland Fire Decision Support System

APPENDIX C: FIRE MANAGEMENT PLAN FIGURES

Figure C. 1. Vicinity Map

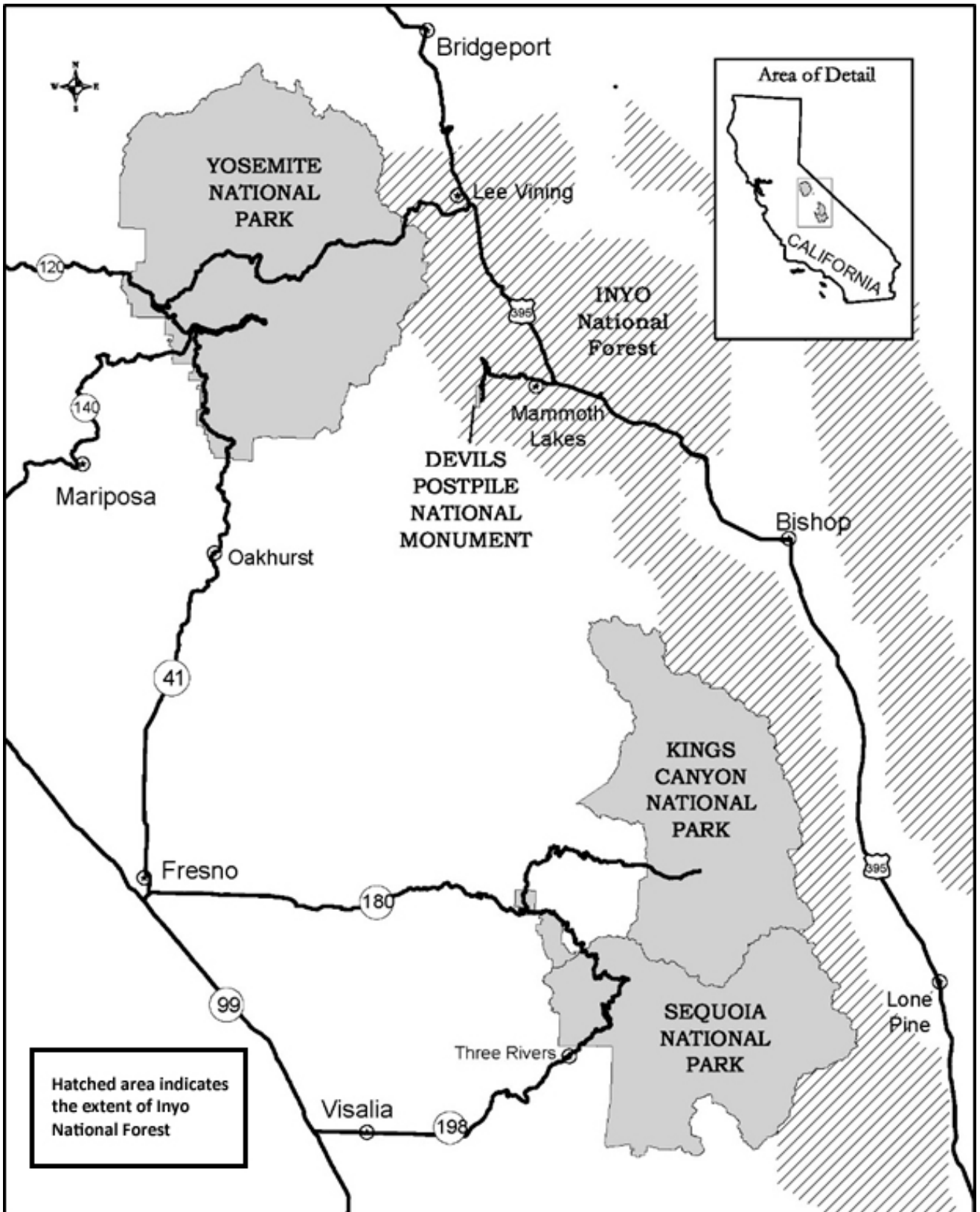


Figure C. 2. Devils Postpile National Monument

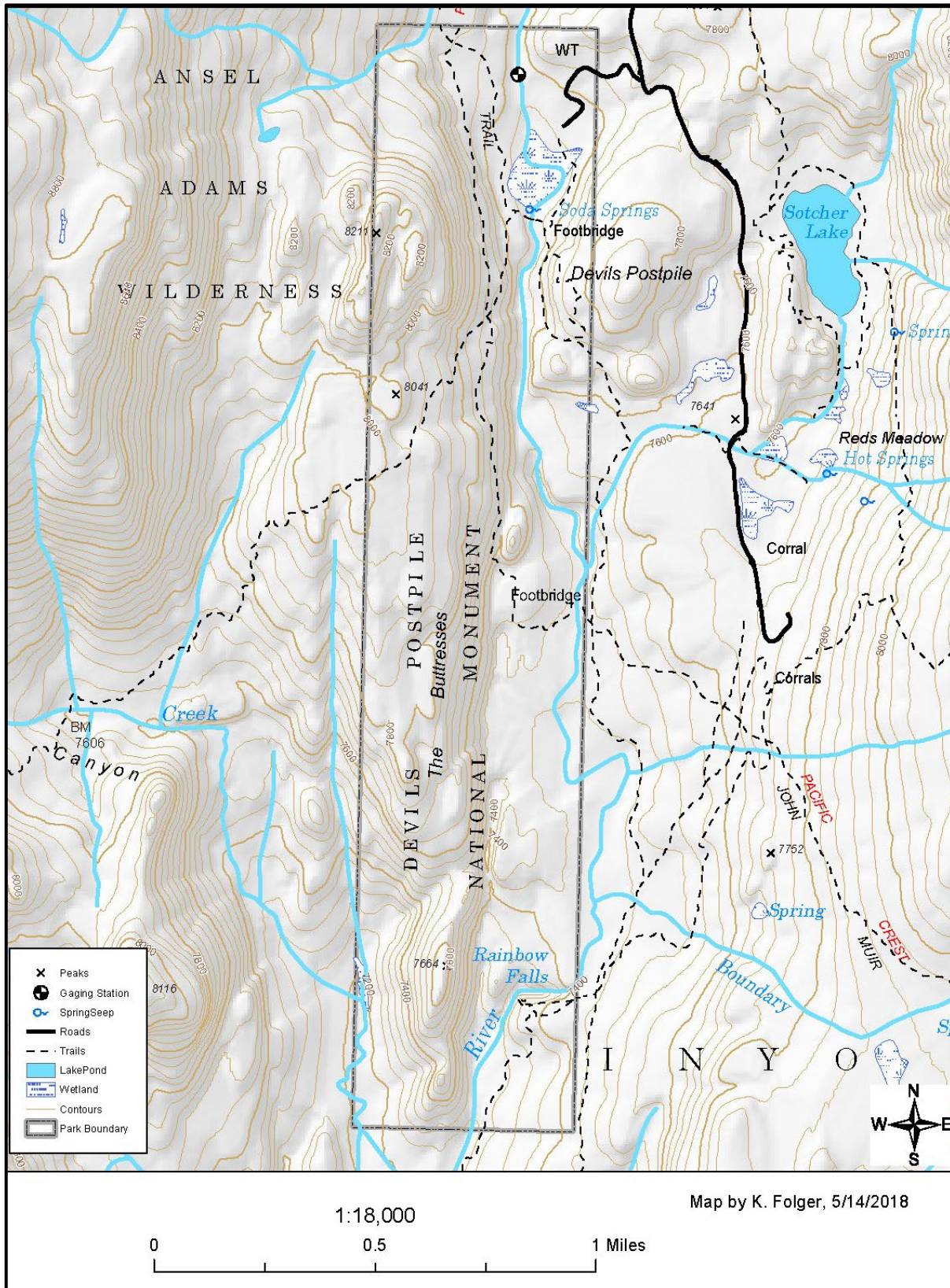




Figure C. 4. Rainbow Fire Burn Severity by Proposed Treatment Unit

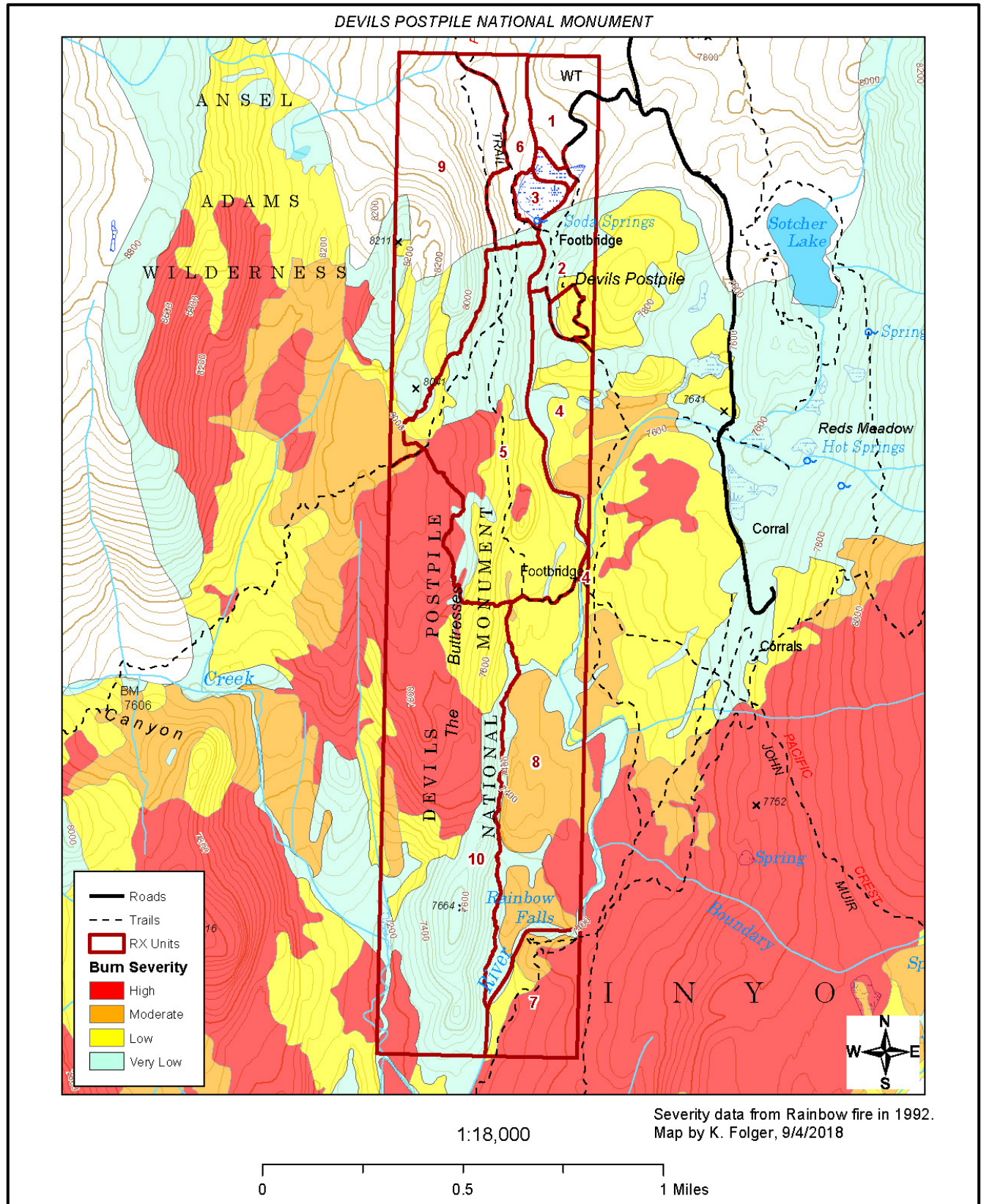


Figure C. 5. 2011 Devils Windstorm Blowdown Severity (2012)

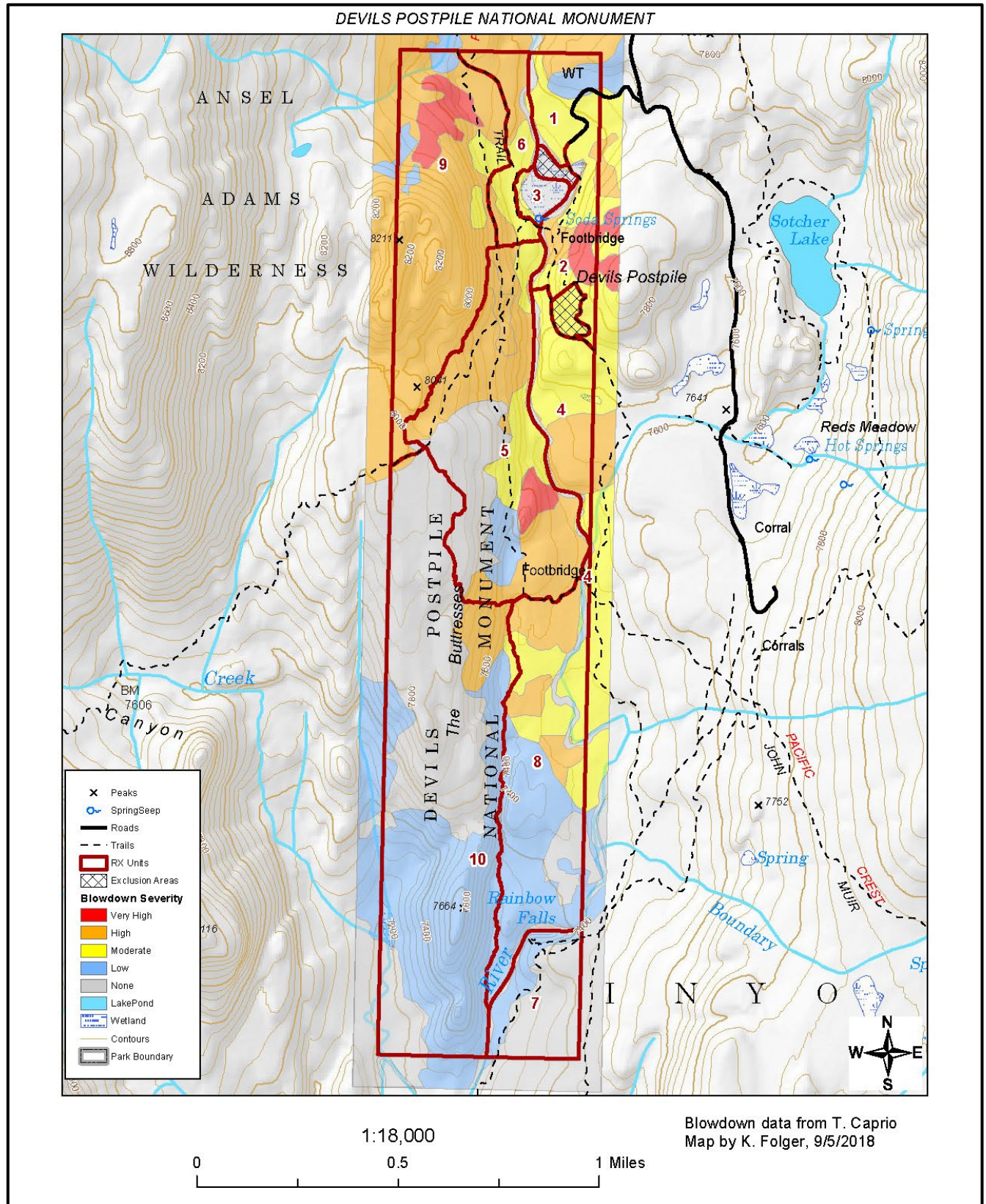


Figure C.6. Alternative A (No Action Alternative) Full Suppression with Limited Fuels Treatments

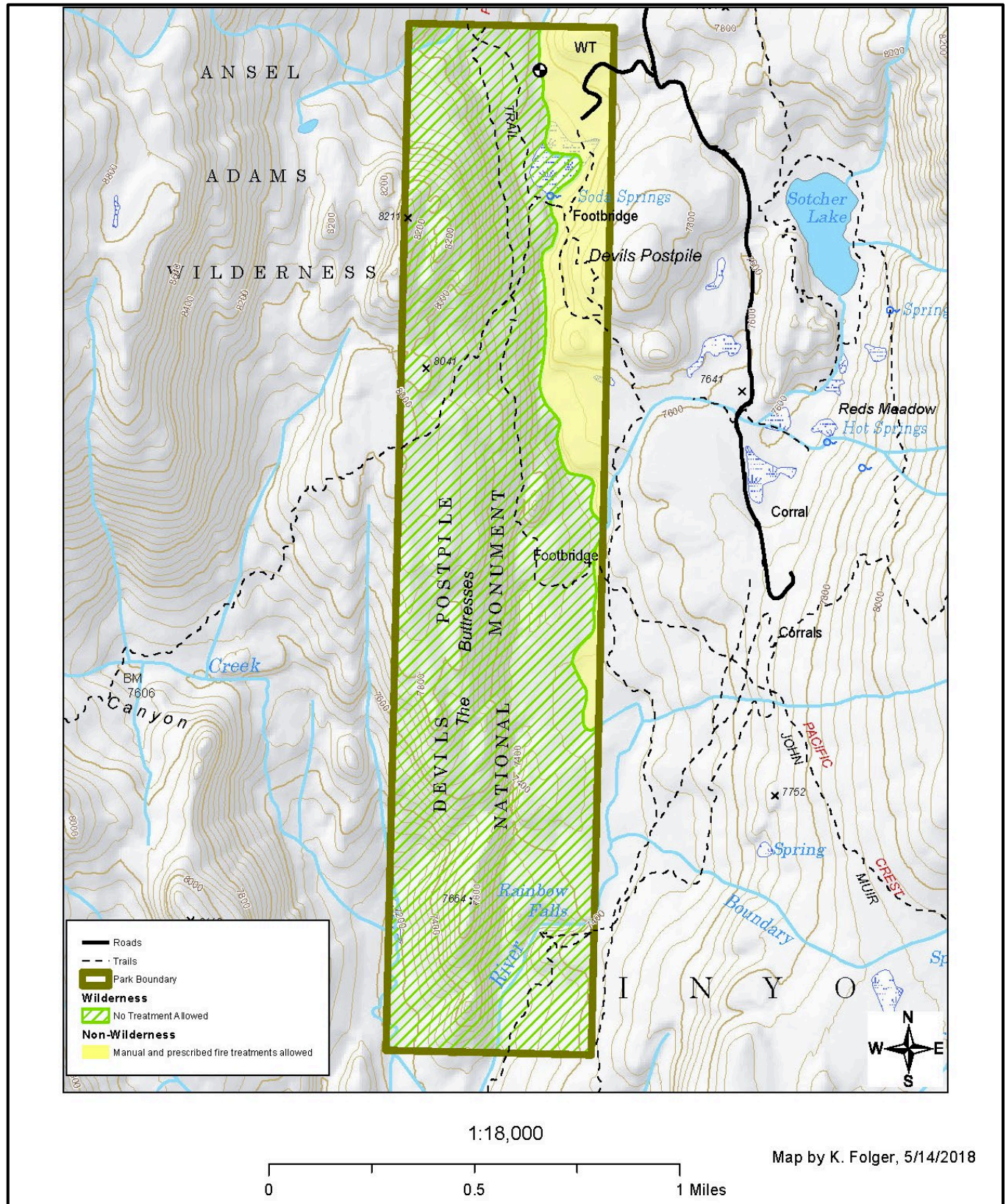


Figure C. 7. Alternative B (Preferred Alternative) Targeted Suppression with Limited Managed Wildfire and Monument-Wide Fuels Treatments

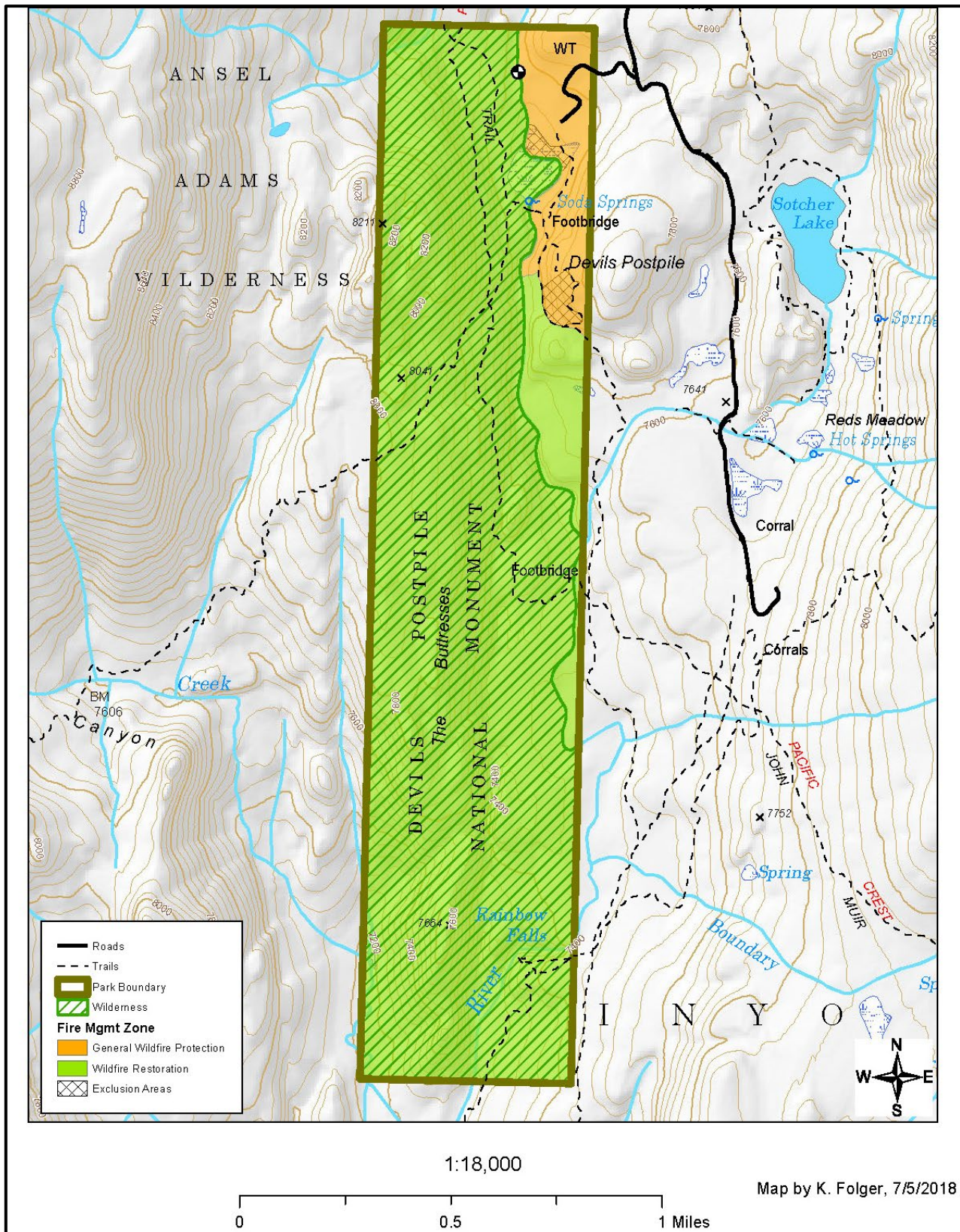


Figure C. 8. Alternative B, Proposed Treatment Units

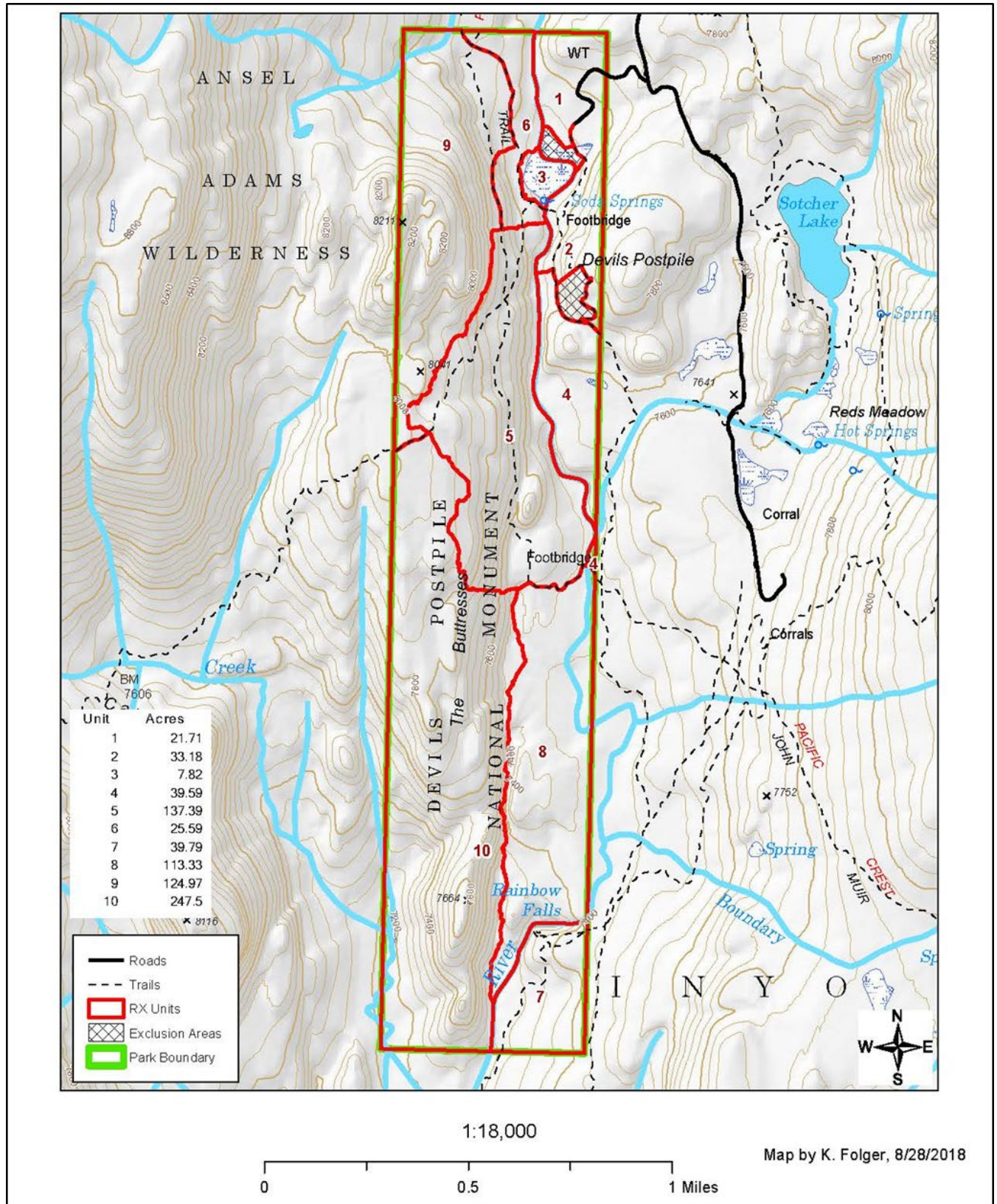


Figure C. 9. Devils Postpile National Monument Vegetation

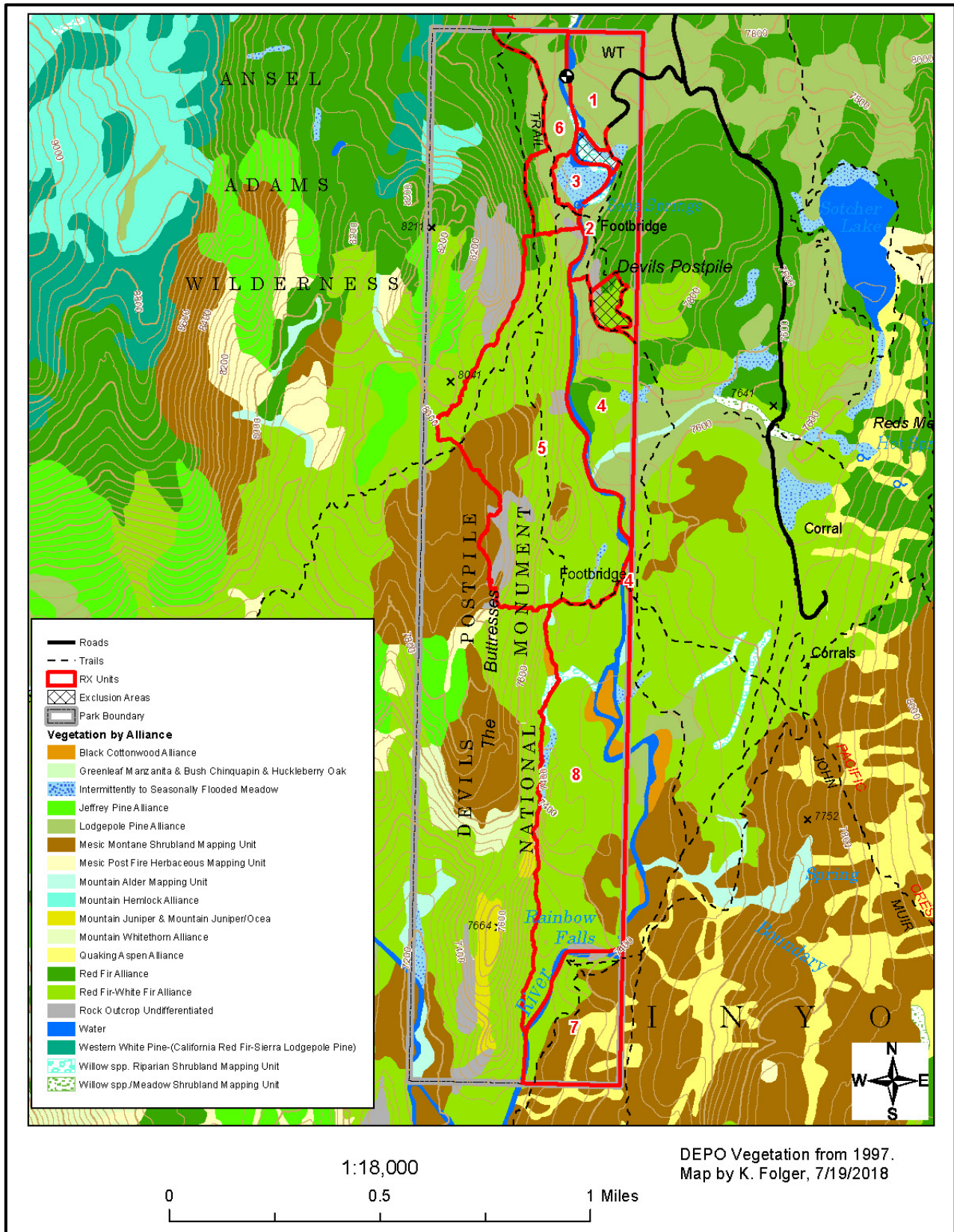


Figure C. 10. Pre-prescribed burn treatment photograph taken in 2012 at the monument; note the heavy accumulation of downed trees obscuring the viewshed.



Figure C. 11. Pre-prescribed burn treatment photograph taken in 2013 following some manual treatment of downed trees.



Figure C. 12. Pre-prescribed burn treatment photograph taken in 2015 prior to prescribed fire.



Figure C.13. Post-prescribed fire treatment photograph taken in 2016 following a 2015 prescribed fire; note the open understory and slight scorching of needles on residual trees.



Figure C. 14. Post-prescribed fire treatment photograph taken in 2017 following a 2015 prescribed fire; note that most scorched needles on residual trees have been shed and some charring is still visible on trunks and downed logs.



Figure C. 15. Viewshed Analysis for the Pacific Crest Trail

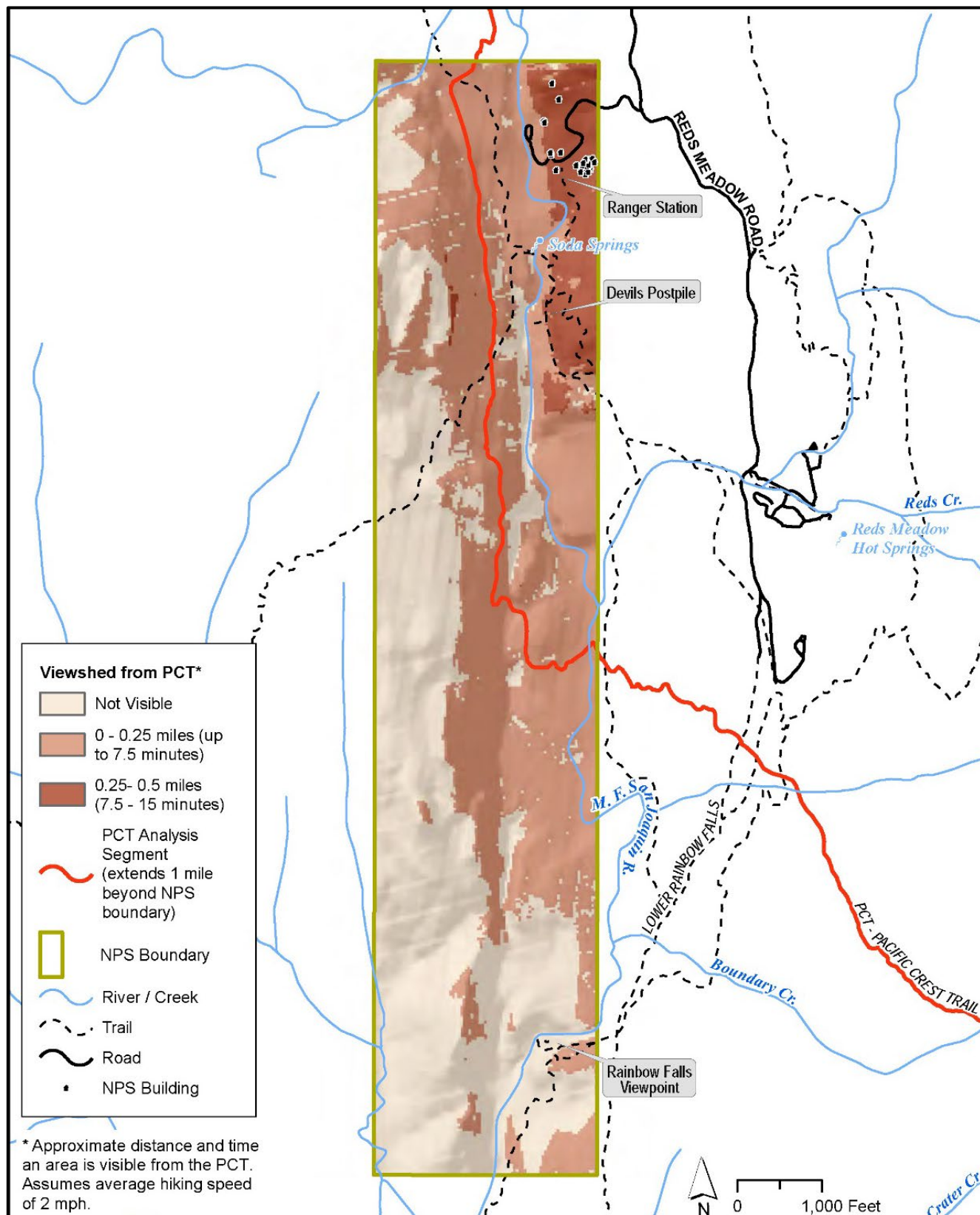


Figure C. 16. Viewshed Analysis of Visibility from the Devils Postpile Formation Viewpoint

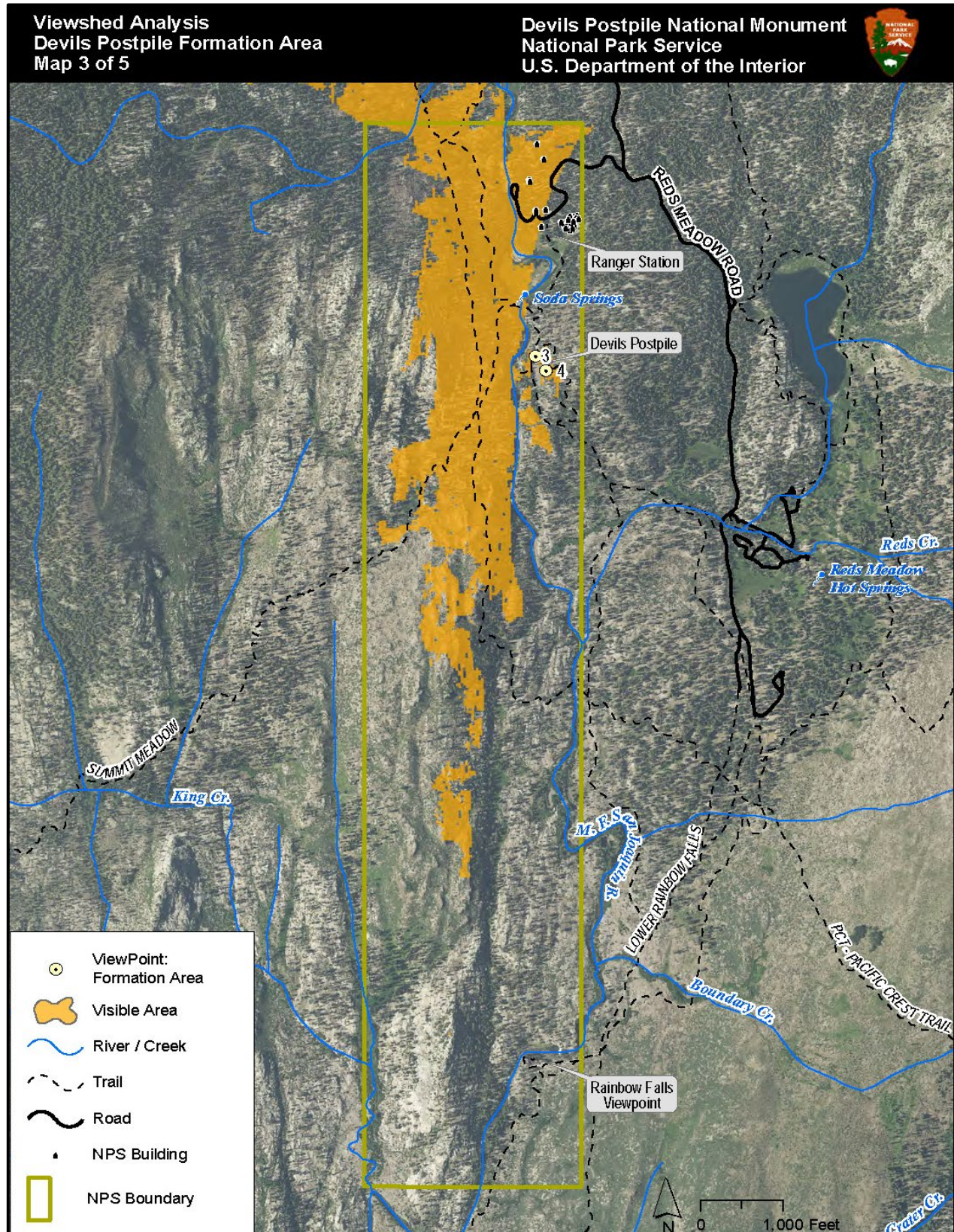
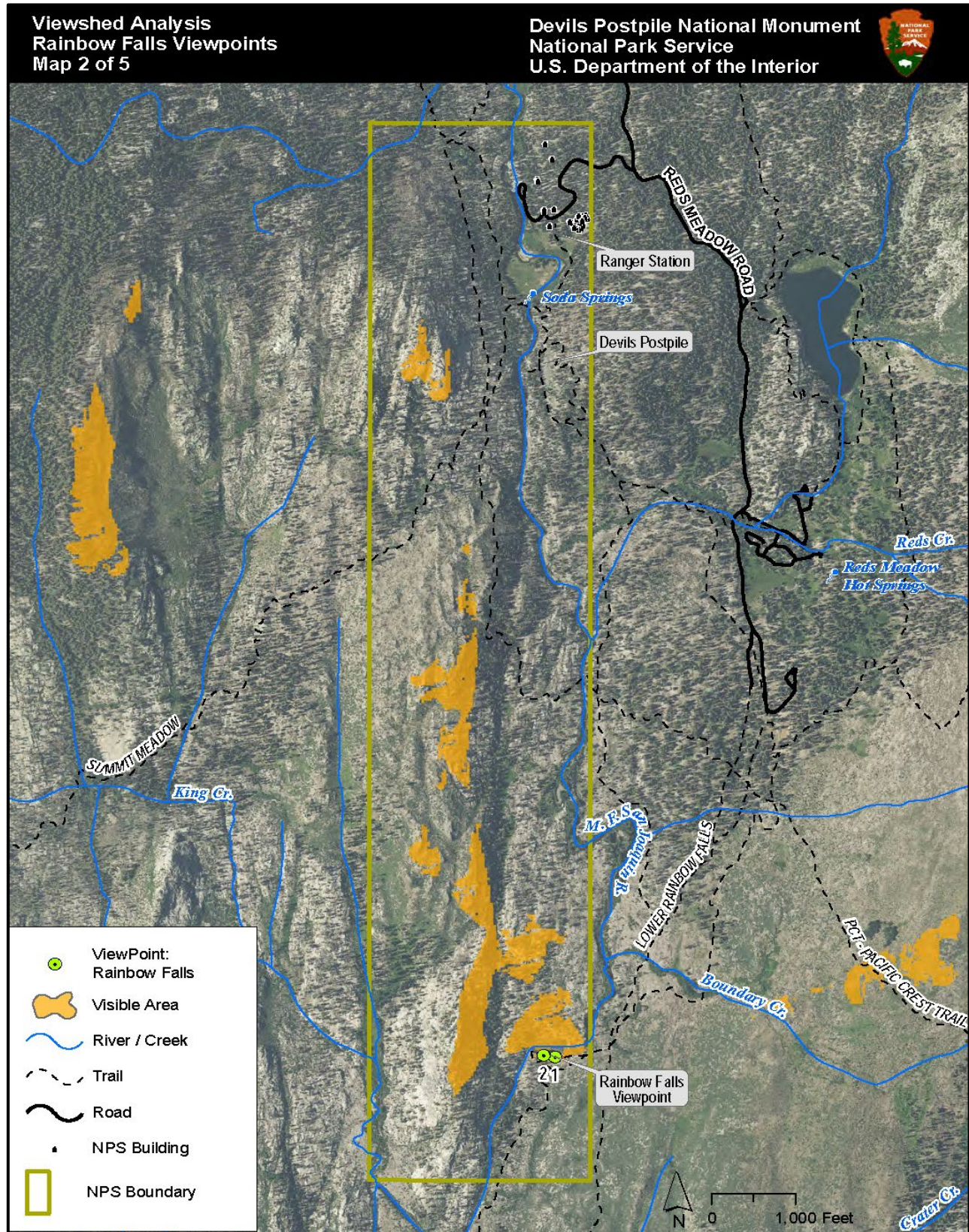


Figure C. 17. Viewshed Analysis of Visibility from the Rainbow Falls Viewpoint



APPENDIX D: MINIMUM IMPACT STRATEGIES AND TACTICS AND MITIGATION MEASURES

The NPS places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse impacts. Mitigation measures and best management practices (BMPs) incorporate the concept of MIST applied specifically to the monument. The following mitigation measures and BMPs are common to both alternatives to help avoid or reduce potential adverse effects of each alternative as well as to protect natural and cultural resources, protect the safety of firefighters and the public, and promote biodiversity and ecosystem health.

General FMP Mitigation Measures

- FMP-1** The monument Superintendent or designee will be notified of all planned and unplanned fire management activities with the potential to impact operations.
- FMP-2** Safety guidelines described in the current Wildland Fire Incident Management Field Guide and the Incident Response Pocket Guide will be employed on all fire management actions.
- FMP-3** No fire chemicals including retardant, foam, or surfactants shall be used in the monument without prior approval from the Superintendent or designee. To protect the scenic corridors in the event of an approaching fire, water drops should be used to minimize tree mortality and scorch in the forested areas surrounding Rainbow Falls and in the viewing area in front of the Postpile. If retardant or other fire chemical use is approved by the Superintendent or designee, no fire chemical use will be released within a 300-foot buffer zone surrounding wetlands, the San Joaquin River, Reds Creek and Boundary Creek, the cliffs surrounding Rainbow Falls, or the Postpile formation and other areas identified by the Superintendent and adhere to the Interagency Policy for Aerial and Ground Delivery of Wildland Fire Chemicals Near Waterways and Other Avoidance Areas as described in Chapter 12 of the *Interagency Standards for Fire and Fire Aviation Operations* (U.S. Department of the Interior and U.S. Department of Agriculture 2018) or future revised version.
- FMP-4** The monument's 100,000-gallon water tank will be used as the primary water source for structure protection whenever possible.
- FMP-5** The San Joaquin River within the monument will not be used as a water source for bucket drops. Water sources with potential to harbor invasive species will not be used as a water source for bucket drops in the monument.
- FMP-6** Low-pressure water application (sprinklers, backpack pumps, etc.) will be used to minimize hydraulic excavation and erosion.
- FMP-7** No motorized vehicles or heavy equipment (such as graders, bulldozers, or other tracked vehicles or earthmoving equipment) will be used off of established roads in the monument without the authorization of the Superintendent or designee.
- FMP-8** Within 30 feet of all wetlands, including the San Joaquin River, Reds Creek, and Boundary Creek, no burns will be ignited, though fires will be allowed to back into the buffer area. Minor soil disturbance and vegetation removal may occur within this buffer to allow a fireline to traverse the buffer and tie into an unburnable area.
- FMP-9** All handheld powered equipment, drip torches, and fuel storage containers will be regularly inspected for leaks and stored and refilled at least 100 feet (30 meters) from open water. Portable pumps will be placed within spill control structures.
- FMP-10** Erosion control measures will be implemented near riparian corridors and wetlands to minimize discharge of sediments to aquatic habitats.

- FMP-11** On-the-ground suppression actions or fireline construction for prescribed burning involving ground disturbance or tree felling in wetlands or riparian corridors will require prior approval of the monument's Superintendent or designee. All fireline construction will conform to MIST.
- FMP-12** Natural barriers will be used as extensively as possible when constructing firelines for suppression or prescribed burning.
- FMP-13** Mop-up activities will be selected that minimize ground disturbance.
- FMP-14** READs will be involved during and after wildfire and during prescribed burn planning as dictated by values at risk, to ensure that prescriptions and burn objectives do not conflict with objectives for the protection of sensitive vegetation, wildlife, and important elements of wildlife habitat such as snags and woody debris.
- FMP-15** Historic structures, sensitive cultural sites, the Rainbow Falls viewshed, and the Postpile formation will be protected from fire by improving defensible space around them.
- FMP-16** Full implementation of fuel reduction projects will be phased across the monument over a minimum of 5 years. Implementation is dependent on weather conditions and the availability of funding and staffing.

Air Quality Mitigation Measures

- AIR-1** All wildland fire activities within the monument will comply with the San Joaquin Valley Air Pollution Control District's *Unified Guidelines and Procedures for Smoke Management* (Title 17 of the California Code of Regulations). The NPS will work with the San Joaquin Valley Air Pollution Control District to identify optimal windows for good smoke dispersion in conformance with the Guidelines.
- AIR-2** Prescribed burns will be timed to minimize smoke impacts on air quality and visibility utilizing favorable conditions of atmospheric stability, mixing height and transport winds.
- AIR-3** Timing of and ignition methods for prescribed burns will be reviewed by fire managers to minimize smoke impacts. Personnel will be trained in emission reduction techniques as outlined in the National Wildfire Coordinating Group Smoke Management Guide (Hardy et al. 2001) and continuous monitoring will be required throughout the burn.
- AIR-4** No prescribed burns will be ignited during San Joaquin Valley Air Pollution Control District burn bans. All prescribed burning, and managed natural wildfires will be coordinated with the Great Basin Unified Air Pollution Control District in order to address Mammoth Lakes and Great Basin air quality concerns. All monument prescribed burns will have a companion Smoke Management Plan entered into the Prescribed Fire Information Reporting System (PFIRS) and approved by the San Joaquin Valley Air Pollution Control District.
- AIR-5** The monument will notify the public by press release and signage of upcoming prescribed burns and wildfire managed for multiple objectives, and provide information on measures individuals can take to minimize their exposure to smoke.

Vegetation and Wetland Mitigation Measures

- VEG-1** Firelines will be located outside highly erosive areas, steep slopes, and other sensitive areas wherever possible. Following fire management activities, firelines will be rehabilitated and water barred, and litter and duff will be pulled back for use in rehabilitating firelines where mineral soil has been exposed. All cut trenches will be backfilled and all cut debris scattered.
- VEG-2** Wherever feasible, the NPS will exclude areas of known noxious weed infestations from fire management actions including fireline construction. Monument resource advisors will monitor

wildfire locations for exotic plant species post-burn and manage as necessary. NPS will survey for noxious weeds in treatment units prior to ignition of prescribed fires.

- VEG-3** Heli-base operations outside of the monument shall ensure limited contamination of sling loads with exotic seed sources by using a base tarp and mowing when necessary at the remote location (if applicable to the site).
- VEG-4** All equipment, clothing, and gear must be cleaned prior to entering the monument to prevent the spread of exotic species. The Incident Action Plan will include measures to contain the spread of exotic species.

Wildlife Mitigation Measures

- WLDF-1** Fire management actions will normally be scheduled for August 1 through April 30 to avoid disturbance to nesting birds in conformance with the Migratory Bird Treaty Act unless a nesting bird survey is conducted by a qualified surveyor within 3 days prior to project initiation. If nesting activity is noted within the project area, the NPS biologist will determine if the project should be delayed until nesting is completed or if portions of the work site can be excluded and buffered from disturbance.
- WLDF-2** Firefighter safety is priority, but whenever possible avoid cutting snags over 30 inches in diameter at breast height and retain large woody debris for wildlife habitat.

Threatened and Endangered Species Mitigation Measures

- T&E-1** Surveys for Yosemite toads (*Anaxyrus canorus*) in suitable habitat will be conducted annually. If toads are found, that area will be excluded from future prescribed burns and will be protected as much as possible from future wildland fire.
- T&E-2** There are two wetlands in the monument identified as having suitable Yosemite toad breeding habitat. These wetlands will be excluded from prescribed burns and, if wildfire entry was expected, surveyed for Yosemite toads if during the breeding season.

Visitor Use and Experience Mitigation Measures

- VIS-1** Fire management staff will consider the safety of the public, personnel, and fire crews as the highest priority for all fire management activities.
- VIS-2** Media releases and signage will be used to inform monument visitors about prescribed burns and wildland fire, informing them about potential smoke impacts, trail or area closures, or other restrictions. Caution signs will be installed by the monument where smoke may impact transportation corridors inside and outside the monument.
- VIS-3** If necessary, the Superintendent will authorize temporary closure of some areas to the public and visitors. Prescribed fire notifications and fire information will be posted at public locations, such as trailheads, parking areas, and visitor centers. Fire staff will coordinate closely with rangers to determine the location of visitors and use road/trail closures and restrictions to ensure prescribed fire or wildfire operations do not put visitors at risk.
- VIS-4** The timing of prescribed burns will be approved by the Superintendent and special consideration will be given to limiting activities on weekends and holidays.
- VIS-5** Weather conditions will be closely monitored during the prescribed fire or wildfire managed for multiple objectives to ensure that any changing conditions do not suddenly put visitors at risk.

- VIS-6** To protect visual resource values, all cut ends of logs will be made inconspicuous to visitors and camouflaged where possible. All stumps will be flush cut as close to the ground surface as possible.

Wilderness Character Mitigation Measures

- WIL-1** All planned fire management operations that involve a short-term use that is otherwise prohibited in wilderness will be conducted in accordance with an approved Minimum Requirements Analysis (MRA).
- WIL-2** Wilderness character must be fully considered during all fire management actions from planning through management of individual wildfires, implementation of fuels treatments, and post-fire rehabilitation actions. Fire management resources must be adequately briefed on the concepts of wilderness stewardship and be held accountable for preservation of wilderness character and made aware of specific protections and constraints contained in the monument's Fire Management Plan (FMP).
- WIL-3** Heavy earthmoving equipment such as graders, bulldozers, or other tracked vehicles will not be used in wilderness. The Superintendent can authorize the use of heavy earthmoving equipment and mechanized vehicle use in extreme circumstances in the face of loss of human life and/or property.
- WIL-4** When necessary for effective firefighting, use of motorized equipment in the wilderness such as chainsaw and portable pumps is allowed. Use of helicopters for water drops and sling loads of equipment is approved. All low-level aircraft overflights will be minimized. Except in life/safety emergency, Superintendent approval is required for landings.
- WIL-5** To reduce impacts to wilderness character from unmanned aircraft systems, all drones used in fire operations at the monument shall be used in conformity with general aviation regulations for parks and wilderness (Policy Memorandum 14-05, Unmanned Aircraft – Interim Policy) and the Superintendent compendium for the monument, which includes no take-off, landings, or operation within monument boundaries without Superintendent approval, and the aircraft maintaining the Federal Aviation Administration-requested minimum elevation above ground level of 2,000 feet. Additionally, the drone operator needs to be located outside the wilderness boundary.
- WIL-6** No ground disturbance, beyond minimal firelines, will be permitted without express permission of the Superintendent or designee and consultation with monument resource staff.
- WIL-7** In the event of a wildfire, fireline rehabilitation will be completed before the incident management team and fire resources leave the monument. All flagging and other temporary evidence will be removed prior to release of fire resources.
- WIL-8** A Rehabilitation Plan and Minimum Requirements Analysis will be developed whenever there is a Burned Area Emergency Response (BAER) and/or Burned Area Rehabilitation (BAR) request.
- WIL-9** Project work, including burn operations, shall be conducted during the shoulder season (Labor Day to mid-June of the following year) whenever possible to minimize disturbance to wilderness character and visitor use.
- WIL-10** When available, crews trained in the use of primitive tools will be used for work within the wilderness.
- WIL-11** Plot markers, used in fire effects monitoring projects, will be installed away from trails and areas of visitor use.

Cultural Resource Mitigation Measures

- CUL-1** Prior to all fire management activities, cultural resources in treatment areas will be identified. The cultural resource specialist(s) will provide recommendations on how to mitigate adverse effects on these resources during fire management activities and will coordinate compliance with Section 106 of the National Historic Preservation Act, as appropriate. The cultural resource specialist(s) must be contacted immediately if previously unrecorded cultural resources are discovered during any wildland fire operations; in the event that cultural resources are discovered, they will be recorded, delineated, and protected.
- CUL-2** In the event that a wildfire cannot be managed to avoid cultural resources, suppression lines and ground-disturbing activities exposing mineral soil will avoid cultural sites to the greatest extent feasible.
- CUL-3** If National Register of Historic Places—eligible or —listed cultural resources cannot be avoided, an appropriate mitigation strategy will be developed in consultation with the State Historic Preservation Officer (SHPO) and associated tribes.
- CUL-4** Consultations with Native Americans linked by ties of kinship, culture, or history to monument lands will be initiated in the event of the inadvertent discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony, and all provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 will be followed.
- CUL-5** Historic structures that have been included within wilderness will be protected and maintained in accordance with the pertinent laws and policies governing cultural resources using management methods that are consistent with the preservation of wilderness character and values. Laws pertaining to historic preservation remain applicable within wilderness but must generally be administered to preserve the area's wilderness character (16 USC 1133(a)(3)). The responsible decision-maker will include appropriate consideration of the application of the provisions of the Wilderness Act in analyses and decision-making concerning cultural resources.
- CUL-6** All project work relating to potential cultural landscapes will be conducted in accordance with the guidelines and recommendations of the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes (36 CFR Part 68).
- CUL-7** The monument will provide the INF with a prioritization list for structure protection identifying the historic Ranger Cabin as the highest priority.
- CUL-8** The NPS will work with the INF to develop a Structure Protection Implementation Plan for the monument that will become an appendix to the FMP and be incorporated into the annual letter of delegation and WFDSS.
- CUL-9** Staging areas for equipment, command centers, and crew camps shall avoid known archeological resources.
- CUL-10** Prior to initiating a prescribed fire, the NPS will coordinate the development of the prescribed burn plan with cultural resource staff input to identify sensitive cultural locations and protocols for burning near archeological sites. Section 106 compliance will be completed for prescribed burn plans with the California SHPO, and identified cultural resources will be either avoided in the burn unit or prepped prior to the burn in order to mitigate impacts. Preparations may include manually removing fuels on or around the archeological resource; removing heavy logs and fuels from vulnerable areas; and removing or covering stumps with dirt or foam where burnout could affect subsurface cultural deposits. Piles to be burned will not be placed in or near sensitive archeological resources.

APPENDIX E: SCOPING PROCESS AND SUMMARY OF SCOPING COMMENTS RECEIVED

As defined by NEPA regulations, scoping is “an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action” (40 CFR 1501.7). The scoping process should be focused on determining the extent and nature of issues and alternatives that should be considered during the preparation of the EA. The scoping process should be conducted internally with NPS staff and externally with the general public and staff of regulatory and partner agencies and should continue throughout the early stages of EA preparation.

Internal Scoping

NPS staff from Devils Postpile and the Pacific West Regional Office conducted two internal scoping meetings in late 2017 with a wide range of NPS natural resource, cultural resource, and fire management specialists discussing the purpose and need for the FMP update, proposed goals and objectives, alternative strategies for updating the FMP, and the range of issues that should be addressed in the FMP EA.

Public Scoping

Public, or external, scoping was conducted through the NPS Planning, Environment and Public Comment website where a scoping notice and brochure were posted on January 8, 2018, to inform the public of the proposed project. The scoping brochure was also sent to the Devils Postpile National Monument’s mailing list to solicit feedback for the EA. Newspaper articles and announcements were also published by local media outlets notifying the public of the scoping meeting and public comment period.

The NPS then conducted public scoping for the FMP update from January 8, 2018, to February 16, 2018. A press release in advance of the scoping period was distributed to media outlets that serve the broader Town of Mammoth area. The NPS emailed a scoping brochure describing the revised FMP and the range of opportunities for commenting during scoping to local residents on the park mailing list, elected officials, regulatory agency staffs, fire officials, and local organizations. Notice of the scoping period was posted on the park’s website. Commenters were pointed to the NPS Planning, Environment and Public Comment website for Devils Postpile National Monument as one method of providing scoping input. The scoping brochure, maps, and proposed goals and objectives were available to the public to download on the Planning, Environment and Public Comment website.

The NPS hosted a public scoping open house on January 17, 2018, on the proposed FMP update with assistance from fire management staff from INF. The open house was held at the Mammoth Lakes Public Library. Attendees included representatives of the Big Pine Paiute Tribe, the Friends of Inyo, and a reporter from *The Sheet*, a local newspaper.

Summary of Scoping Comments Received

Table E.1 provides a summary of the comments received from individuals, organizations, and agencies during the scoping period. Brief descriptions of input received from the organizations and agencies follows.

Table E.1. Summary of Public Scoping Comments

Topic	Comment
Fire management strategy and potential alternatives	As the monument is small and surrounded by the INF it should be managed in the same way as the surrounding forest.
	Commenters support the active management of fuels and forest thinning to reduce the risk of a high-severity wildfire.
	The proposed alternative should consider a multiple-use strategy for fuel reduction.
	The FMP alternatives should support restoring the natural role in fire in NPS parks.
	Explain the prioritization of prescribed burning projects in Reds Meadow and Devils Postpile in relation to other forest priorities.
	The EA should describe past and proposed treatments in the northeastern corner of the monument that was subject to the 2011 Windstorm.
	The EA should describe treatments for the area in the southeast that converted to chaparral following the 1992 fire.
	The EA should explain the need for a shift in fire management strategy from fire suppression to proactive fuel reduction.
Comments on the potential scope of the resource impacts	The EA should propose annual acreage targets for treatment that would needed to achieve the shift of the forest from restoration to maintenance zoning.
	The current condition of the monument with high numbers of dead trees in the wilderness is a hazard that could threatened the resort and the Town of Mammoth Lakes if a lightning strike should start a wildfire.
	The alternatives should include mitigation that would set a minimum number of snags and logs to be retained per acre for treatment areas to preserve wildlife habitat.
	The EA should address potential impacts to threatened and endangered species.
	The EA should describe the types of archeological sites in the monument and what tribes were associated with the monument lands.
	The EA should describe the cost of prescribing burning.
	The EA should describe the effects on forest health of the 2011 Devils Windstorm.
	The EA should describe how fuels treatments would be carried out and whether heavy equipment would be used.
Questions related to the FMP	Did the NPS plant seedlings after the 1992 fire?
	How would the monument be evacuated if there is a fire during the busy season?
	Include a vegetation map of the monument.
	Describe the fire history of the monument.
	Explain the term climate change refugia.
	Will science be used to direct fire management?
	Will the FMP address conifer establishment in Soda Springs Meadow?

Mammoth Fire Safe Council recognizes the high fire risk at Devils Postpile National Monument (DEPO), supports fuel reduction projects, and would welcome a level of participation in the FMP, as Reds Meadow drainage is a significant area for the community.

Friends of Inyo commented that pile burning is not sufficient to address the fuels problem at DEPO. The primary goal of the FMP should be to work with fire to build fire resilience in the monument and the use of natural ignitions will be key to achieving this. Goal 7 should be supplemented with an objective addressing sensitive wildlife and plants. The FMP should reflect that large woody debris and snags are important to wildlife. The FMP should use the best available information on fire frequency and develop acreage targets for fire use that quantify fire use needed to restore a more natural fire regime. The plan

should include public education component addressing living with fire. DEPO fire management zones should align with those of the INF.

Pacific Crest Trail Association commented that the FMP should assess the potential effects on the trail user in the wilderness on the PCT if manual thinning is used to address high fuels in the wilderness. Mitigation measures should be developed to minimize these impacts on the wilderness experience.

Mammoth Lakes Fire Protection District recognizes that the town is in an extreme fire hazard zone and that, due to the prevailing winds, a fire in the monument could threaten Old Mammoth and the Town. Fuels management and defensible space are key priorities. The FMP should evaluate tree density around the administrative compound and propose that maintenance to the exteriors of the structures use fire resistive materials. The FMP should address emergency ingress/egress along the existing access road and safety zones in the Valley in the event of a wildfire.

Big Pine Paiute Tribal Council asked if the plan would be setting annual acreage targets to meet the overall goal of restoring a more natural fire return interval to the monument's forests. The question was raised regarding whether the forests would be thinned and timber sold to achieve the desired reduction of fuels.

APPENDIX F: COORDINATION AND CONSULTATION

The NPS has taken several steps to coordinate and consult with local governments, federally recognized tribes, and state and federal agencies. Information about public scoping is provided in Appendix E.

Letters were sent to the following entities to inform them of the revised FMP/EA and to solicit input in the environmental compliance process:

- Big Pine Paiute Tribe of Owens Valley
- Bishop Paiute Tribe, Bridgeport Indian Colony
- Fort Independence Indian Community of Paiute Indians of Fort Independence
- Lone Pine Paiute-Shoshone Tribe
- Mono Lake Kutzadikaa Paiute Indian Community
- North Fork Mono Tribe
- North Fork Rancheria of Mono Indians of California
- Utu Utu Gwaitue Paiute Tribe of the Benton Paiute Reservation of California,
- California SHPO
- U.S. Fish and Wildlife Service

On January 25, 2018, the NPS attended the regularly scheduled Mono County Collaborative Planning meeting and made a presentation to the attendees that was followed by discussion of the proposed FMP update.

On January 29, 2018, the monument's Superintendent staff met and discussed the proposed update with the Chief Freivalt of the Mammoth Lakes Fire Protection District. The Chief expressed support for the work agencies were doing around the Town of Mammoth Lakes for fuel reduction. Also discussed was the need for planning effort to develop emergency response plans for Reds Meadow Valley in the event of a wildfire or other emergency.

On February 20, 2018, the NPS staff presented information on proposed FMP update to a regularly scheduled tribal consultation meeting for federal agencies at the Big Pine Tribal Headquarters in Big Pine, California. Discussion followed the presentation.

On February 22, 2018, NPS staff a similar presentation was made to the Tribal Council meeting of the Bishop Paiute Tribe followed by a brief discussion.

On April 13, 2018, NPS submitted a draft Biological Assessment to the U.S. Fish and Wildlife Service identifying potential effects to the Yosemite toad. The U.S. Fish and Wildlife Service provided a concurrence letter, which ended the informal consultation period for the FMP revision on May 21, 2018.

APPENDIX G: PROGRAMMATIC MINIMUM REQUIREMENTS ANALYSIS



SEQUOIA AND KINGS CANYON NATIONAL PARKS

MINIMUM REQUIREMENT ANALYSIS WORKSHEET

“... except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...”

– The Wilderness Act, 1964

Instructions:

A Minimum Requirement Analysis (MRA) is required for ***all*** administrative actions in wilderness that either propose a Wilderness Act Section 4(c) prohibited use or have an effect on wilderness character (per Director's Order 41). **See the Minimum Requirement Instructions for directions and background materials to assist you with this analysis.** Additional instructions may be found at: <http://www.wilderness.net/mrdg/>

Routing Information:

- 1) Complete the Minimum Requirement Analysis Worksheet (MRA). Name the file as follows: SubmissionDate_ShortTitle_LastName_Version1.docx.
- 2) Email the MRA (WORD version) to (erik_frenzel@nps.gov) and the Environmental Protection Specialist (EPS) (nancy_hendricks@nps.gov) for review. **You must submit your MRA at least two weeks before your proposed action is to occur.**
- 3) **If revisions are necessary**, the EPS will:
 - a. Return the MRA to the project proponent for revisions. Once revisions are made, project proponent will rename file as Version2. Then, repeat Step 2.
- If no revisions are needed**, the EPS will:
 - a. Rename the file as Final and save it under: S:\SUPT\Environmental Compliance Office\Wilderness\MRMTs and MRAs\Year\Final
 - b. Forward the electronic copy to the Division Chief for review and signature and “cc:” the project lead.
- 4) Division Chief will review and forward a printed copy to the Superintendent for signature. If the Division Chief changes the MRA, they will return the updated version electronically to the AWC and EPS. **If the MRA is part of a larger environmental compliance or permitting package, the entire package must go to the Superintendent for signature at the same time.**

- 5) The signed MRA will be sent to the EPS for record keeping. Signed/scanned copies will be filed as PDFs under: S:\SUPT\Environmental Compliance Office\Wilderness\MRMTs and MRAs\Year\Signed MRAs
- 6) The EPS will email a PDF of the signed MRA Worksheet to the project proponent so that he/she can review mitigation, monitoring, and reporting requirements.

GENERAL INFORMATION:

Project Title: Implement 2018 Wildland Fire Management Plan - Devils Postpile National Monument Wilderness

Project Duration: Programmatic/Ongoing

(For longer projects, review the MRA yearly to determine accuracy. Prepare a new MRA if the project is modified, new prohibited actions are proposed, or at a minimum every 5 years.)

Date Submitted: _____

Project Proponent: Deanna Dulen – DEPO Superintendent

Contact Information: 760-924-5505 – deanna_dulen@nps.gov

Tracking Number (Office Use Only): _____

STEP 1:

Determine if any administrative action is necessary.

Description of Situation:

What is the situation that may prompt administrative action? What is the reason that you are proposing an action (or actions) in wilderness? Do not describe the action itself. Rather, describe the desired goal or outcome.

Changes are being proposed for fire management actions in the Devils Postpile portion of the Ansel Adams Wilderness.

The changes respond to direction included in the parks recently updated General Management Plan (2014) and Resource Stewardship Strategy (2017). Proposed changes are primarily driven by fuel loads and altered forest structure that continue to persist following the 1992 Rainbow fire and a significant 2011 wind event that created extensive blowdown of mature trees.

The 2005 FMP did not authorize fuels activities in wilderness or provide for the management of wildfire for multiple objectives, including resource benefit. The 2005 fire management program is represented by the 'No Action' alternative in the 2018 EA.

The preferred alternative described in the 2018 Environmental Assessment (EA) for the Fire Management Plan (FMP) proposes fuels management activities in wilderness, as well as expanded options for managing wildfires.

Note: Responses in Step 1 reflect the 'Preferred Alternative' proposed in the 2018 Environmental Assessment for the Fire Management Plan. Responses to questions in Step 3 compare the

consequences of the 'Preferred Action' and the 'No Action – Continue Implementation of 2005 FMP' and contained in the EA.

A. Options Outside of Wilderness

Can actions taken outside of wilderness adequately address the situation and meet project goals?

Yes: ☐ No: ☒

Explain:

The 'Preferred Alternative' is designed to directly manage certain resources within the wilderness and contains actions that must be implemented within wilderness to meet natural resource and fire management objectives.

B. Valid Existing Rights or Special Provisions of Wilderness Legislation

Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)? Cite law and section.

Yes: ☐ No: ☒

Explain:

No existing rights or special provisions are affected by the proposed actions.

The FMP is a planning document which details "...such measures may be taken as may be necessary in the control of fire...subject to such conditions as the Secretary deems desirable" as provided for in Section 4(d)(1) of Wilderness Act of 1964, and reaffirmed in California Wilderness Act of 1984 (accompanying House Report 98-40 stated that "...such measures should, to the maximum extent practicable, be implemented consistent with maintaining the wilderness character of areas, while at the same time protecting the public health and safety and protecting private property located immediately adjacent to wilderness areas"). The FMP also includes actions to restore and maintain elements of wilderness character (especially natural character) consistent with Wilderness Act provisions.

C. Requirements of Other Legislation

Is action necessary to meet the requirements of other federal laws? Cite law and section.

Yes: ☐ No: ☒

Explain:

Federal policy requires a response to wildfire ignitions but does not prescribe a particular response. NPS policy allows a range of responses to wildfire ignitions that can consist of monitoring from afar up to and including aggressive suppression.

Local decisions concerning the appropriate level of wildfire response and other fire management actions are, by policy, required to be addressed through the land management planning process, which includes the development of an FMP for all areas having burnable vegetation.

D. Wilderness Character

Is action necessary to preserve one or more qualities of wilderness character?

Untrammeled: Yes: ☒ No: ☐

Explain:

The preferred alternative describes a range of expanded wildfire responses and fuels management actions within wilderness. The actions would occur over a period of 10-20 years and create trammeling. The long-term result of the actions (20+ years) would be less intrusive wildfire management as naturally-caused wildfires would have a higher probability of being allowed to burn through wilderness areas with less intrusive management strategies and actions. Over the long term the proposed actions would reduce trammeling relative to the current (no action) program outcomes.

Undeveloped: Yes: ☐ No: ☒

Explain:

The proposed actions are not necessary to preserve the undeveloped character of the wilderness.

Natural: Yes: ☒ No: ☐

Explain:

Actions proposed in the FMP are necessary to maintain natural vegetation conditions, wildlife habitat and ecological processes within the wilderness.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation:

Yes: ☐ No: ☒

Explain:

The actions are not necessary to preserve the Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation quality.

Other Features of Value (e.g. Cultural Resources, Science):

Yes: ☒ No: ☐

Explain:

Current and proposed fire management actions are intended to protect sensitive cultural and other features of value within and adjacent to wilderness from damage from severe fire effects and from fire operations. Special resources to be considered are derived from the parks General Management Plan (2014), and Resource Stewardship Strategy (2017) and include: the postpile geologic formation, the Rainbow Falls viewshed, and several cultural resources (historic and pre-historic) within the wilderness.

While both the No Action and Proposed Action alternatives provide some protection for these other features, the proposed action would further reduce the risk by pro-actively reducing unnatural levels of fire fuels, thereby reducing fire intensity, fire severity and spread potential in the vicinity of the other features of value.

E. Public Purposes

Is action necessary to achieve one or more of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act): ***“recreational, scenic, scientific, educational, conservation, and historical use”***?

Yes: ☒ No: ☐

Explain:

F. Other Guidance

Is action necessary to conform to direction contained in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state and local governments or other federal agencies?

Actions described in the 2018 FMP are needed to achieve the conservation and scenic purposes of wilderness following direction provided by the park's General Management Plan and Resource Stewardship Strategy.

Yes: ☒ No: ☐

Explain:

National Park Service (NPS) policy requires units to respond to all wildland fires, the policy is broad and allows a less-than-full-suppression response, provided an approved FMP allows for such actions. NPS policy also allows, though does not require, fuels management activity within wilderness if deemed necessary to restore or maintain natural conditions and/or processes. An approved FMP must be in place to implement fuels projects within an NPS unit.

The recently revised General Management Plan (GMP 2014) identifies the need to restore and maintain natural conditions throughout the Monument, which includes the wilderness (*Chapter 2 – Desired Conditions for Ecological Communities*). This direction is further articulated in the 2017 Resource Stewardship Strategy (RSS, *Page 49 – Fire Regimes*) which describes the desired role of fire in achieving target resource conditions.

Decision:

Is administrative action necessary in wilderness?

To determine if an action is necessary in wilderness, review questions A-F above.

NOTE: The questions vary in weight. A-D have first priority, E has second priority, and F has third priority.

In addition, consider the following: If you do not accomplish the work, what would be the resulting impacts? Would there be adverse effects on wilderness? Would you fail to meet the mandate of other laws and/or policies?

If you are unable to determine if action is necessary based on Step 1 information, consult your Division Chief or supervisor. Researchers should consult the Research Permit Coordinator.

Yes: ☒ No: ☐

Explain:

To meet GMP and RSS direction, it is necessary to implement proactive wildfire and fuel management actions in the wilderness. The actions are necessary to preserve the natural and

untrammeled qualities of wilderness, and to achieve the conservation and scenic purposes of the park and wilderness.

Compliance Pathway:

Is the action covered under an existing plan, management directive and/or other compliance document (i.e., MD-49, EA, EIS, CE/programmatic CE).

Yes: ☒ No: ☐

If yes, provide document name and PEPC reference number:

This MRA will be incorporated on the overall Environmental Assessment for the Devils Postpile Fire Management Plan (PEPC #77317), and associated Devils Postpile Fire Management Plan (2018).

If no (or if you are unsure), contact the Environmental Protection Specialist for instructions.

STEP 2:

Determine the need to develop alternatives.

Does your project propose a Section 4(c) prohibited activity?

Section 4(c) prohibited activities include: the use of mechanical transport and/or motorized equipment and vehicles, the landing of aircraft, and the installation of materials, equipment and/or structures.

NOTE: Installations include items used to support activities such as communications, water development, stock use, or wildlife management. It includes debris such as old dump sites, plane crash sites, or locations of unexploded ordinance. It includes memorials or other monuments other than those placed during land surveys. It also includes unattended measurement or other device(s) left in place for the purpose of recording environmental data or marking a study plot.

Yes: ☒ No: ☐

If yes, proceed to Step 3.

If no, continue with the questions below.

Wilderness Character Questions	Yes or No
Does the proposed activity include human actions that intentionally control or manipulate the components or processes of ecological systems inside the wilderness (i.e. does it involve a trammel)? <i>(This question does not include collecting abiotic samples or handling, removing or killing organisms for scientific identification or measurement.)</i>	<input type="checkbox"/> <input type="checkbox"/>
Would the proposed activity include any of the following: 1) removing or killing rare or sensitive species/subspecies, 2) handling of threatened or endangered species/subspecies, 3) having more than negligible effects on the health or survival of a population of a species/subspecies, or 4) introducing plants and/or animals into the wilderness?	<input type="checkbox"/> <input type="checkbox"/>
Would the proposed activity occur in a sensitive area (e.g. critical habitat) or at a sensitive time for a particular species?	<input type="checkbox"/> <input type="checkbox"/>

Wilderness Character Questions	Yes or No
Does the proposed activity necessitate the establishment of crew camps that exceed normal recreational use (e.g. the installation of food storage lockers, privy structures, or shower facilities)?	<input type="checkbox"/> <input type="checkbox"/>
Would the proposed activity change the trail class of any given trail?	<input type="checkbox"/> <input type="checkbox"/>
Does the proposed activity rely on crews that exceed the maximum group size for a particular area?	<input type="checkbox"/> <input type="checkbox"/>
Would the proposed activity restrict (even temporarily) visitor access to or movement in a particular area?	<input type="checkbox"/> <input type="checkbox"/>
Would the proposed activity result in a discernible and noticeable effect (beyond that expected if the crew were members of a typical/legal recreational group) on opportunities for solitude?	<input type="checkbox"/> <input type="checkbox"/>
If the proposed activity is approved, is there a risk of long-lasting, cascading, or otherwise significant unintended effects?	<input type="checkbox"/> <input type="checkbox"/>
Additional Questions	Yes or No
Would the proposed activity likely be controversial with any publics?	<input type="checkbox"/> <input type="checkbox"/>
Would the proposed activity pose other legal or policy issues?	<input type="checkbox"/> <input type="checkbox"/>
Would the proposed activity occur in an area that already has past, ongoing, or future planned 4(c) prohibited activities?	<input type="checkbox"/> <input type="checkbox"/>
Would the proposed activity result in more than a minor beneficial or adverse effect on park natural or cultural resources, which could require the preparation of an EA or EIS?	<input type="checkbox"/> <input type="checkbox"/>

If you answered yes to any of the questions above, you may be required to complete Step 3. Contact the AWC or the EPS for guidance.

If you answered no to all of the questions, provide a brief project description below and retain this form in your permanent administrative record. Submit an electronic copy to the Assistant Wilderness Coordinator.

Project Description:

Prepared by:

Name	Position	Date
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STEP 3:
Determine the minimum activity.

Develop a range of reasonable and feasible alternatives. You should have at least two alternatives *plus* a “no action” alternative. Add additional pages as necessary. Be sure to describe in detail those aspects of your project that involve 4(c) general prohibitions. These are usually contained in the Untrammeled and/or Undeveloped qualities.

You should also include a list of alternatives that were considered but dismissed, with a brief explanation for dismissal. Alternatives should not be eliminated simply because of the cost or time involved. The potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience.

Please refer to the MRA Instructions for additional information on developing alternatives and identifying effects.

Alternative 1: No Action – Continue implementation of the 2005 FMP

Description of the Alternative:

What are the details of this alternative? When, where, and how frequently will the action occur? What methods and techniques will be used? How long will the activity last? What mitigation measures will be taken?

NOTE: *The positive and negative effects of this alternative should not be included in the description.*

For each alternative, describe: the methods and techniques that will be used; when the activity will take place; where the activity will take place; the necessary mitigation measures; and the general effects to the biophysical and social components of the wilderness resource and the qualities of wilderness character.

Activities:

Wildfire Suppression:

- Suppress all unplanned ignitions
 - o Each event may include: aerial water drops, fireline construction, portable pumps and hoses, limbing trees, cutting vegetation and snags, burnout operations, area closures, mop-up
- Average of 1 time/year
- Typical duration
 - o 1-5 days of active suppression activity
 - o 1-2 weeks monitoring
 - o 1-5 days of fireline rehabilitation

Wildfire for Multiple Objectives:

- None

Manual manipulation of fuels:

- None in wilderness

Pile Burning:

- None in wilderness

Prescribed Fire (broadcast):

- None in wilderness

Fire Effects Monitoring:

- Semi-permanent plot markers
- Plots checked by staff every 5-10 years

4(c) Prohibited uses:

- Chainsaws
- Portable pumps
- Other miscellaneous hand-held power tools (e.g., leaf blower, weed whacker)
- Low level aircraft overflights and delivery of aerial retardant and water drops, aerial delivery of sling loads

Mitigations:

- Utilize Minimum Impact Strategies and Tactics (MIST) for all activities
 - o See *NPS-18 - Chapter 2, Exhibit 2* for MIST standards
 - o Fireline rehabilitation

A. Wilderness Character:

Does this alternative affect the qualities of wilderness character? What mitigation measures will be taken? *For definitions of wilderness character qualities, see the MRA Instructions.*

Untrammeled: Yes: ☒ No: ☐

Explain:

Adversely affects as all unplanned ignitions, including natural ignitions necessary to promote ecosystem processes, are suppressed.

Undeveloped: Yes: ☒ No: ☐

Explain:

Short-term negative impacts from motorized equipment (saws, pumps, leaf blower, weed whacker) for fire suppression. No new fire effects plots would be added to the existing network as a result of the no action alternative.

Natural: Yes: ☒ No: ☐

Explain:

Devil's Postpile is a fire-adapted ecosystem (average 30-year natural fire return interval) where fire exclusion has occurred for approximately 120 years, degrading the natural quality. Continuing the 'No Action' alternative will result in adverse effects as the fire adapted ecosystem will continue be deprived of a keystone natural process until an uncontrollable ignition (similar to the 1992 Rainbow Fire) exceeds the park's ability to control it resulting in uncharacteristic fire severity and effects.

Opportunities for Solitude or Primitive and Unconfined Recreation:

Yes: ☒ No: ☐

Explain:

Infrequent short-term impacts to wilderness access and solitude (sights and sounds of equipment, presence of fire management staff, aircraft, etc.) are expected to occur during and following wildfire operations.

Other Features of Value (e.g. Cultural Resources, Science):

Yes: ☒ No: ☐

Explain:

Other features described in Step 1 are at risk of damage from the effects of wildfire due to unnaturally high levels of fire fuels in their vicinity, which reduces firefighting effectiveness required for their protection, and requires more aggressive firefighting tactics to control fire spread. Aggressive wildfire suppression actions such as retardant drops, fireline construction and vegetation removal prescribed in the No Action alternative may directly damage these resources, or due to increased fuel loads, may be ineffective in providing protection.

B. Safety:

How does this alternative affect visitor and/or employee safety? Does it present a new or changed situation that threatens visitor safety? If there are adverse effects, what mitigation measures will be taken? Which hazards cannot be mitigated?

Visitor Safety:

Area closures will be implemented during fire operations to minimize risk to park visitors and staff. Extreme fire behavior from fires within the wilderness may create public and community safety concerns adjacent to the wilderness.

Employee Safety:

High severity fires fueled by unnatural fuel loads present heightened challenges to firefighter safety.

C. Other Criteria

Does this alternative help maintain proficiency in the use of primitive and traditional skills? Does it affect the special provisions (grazing, mining, water developments, access to non-federal land, etc.) identified in Sections 4 and 5 of the Wilderness Act? Are there any timing requirements or cost constraints that need to be considered?

Yes: ☐ No: ☒

Explain:

Reactive emergency suppression operations generally require aggressive and manipulative actions (e.g., chainsaws and portable pumps), reducing opportunities to access specialized crews trained in the use of primitive and traditional tools.

ALTERNATIVE 2 PREFERRED ALTERNATIVE – IMPLEMENT FUELS WORK AND ALLOW MANAGEMENT OF WILDFIRE FOR MULTIPLE OBJECTIVES

Description of the Alternative:

What are the details of this alternative? When, where, and how frequently will the action occur? What methods and techniques will be used? How long will the activity last? What mitigation measures will be taken?

NOTE: *The positive and negative effects of this alternative should not be included in the description.*

Activities

Wildfire Suppression:

- Suppress all human caused and unwanted natural ignitions
 - o Each event may include: aerial monitoring, water and retardant drops, fireline construction, portable pumps, portable water reservoirs and hoses, limbing trees, cutting vegetation and snags, burnout operations, area closures, mop-up
- Average of 1 time/year.
- Typical duration
 - o 1-5 days of active suppression activity
 - o 1-2 weeks monitoring
 - o 1-5 days fireline rehabilitation

Wildfire for Multiple Objectives:

- Manage some natural ignitions to meet resource objectives
- Each event may include: aerial water drops, fireline construction, relocation of fire fuels, portable pumps, portable water reservoirs and hoses, limbing trees, cutting vegetation and snags, burnout operations, area closures
- Average of 2 times/decade.
- Typical duration
 - o 1-5 weeks per occurrence
 - o 1-5 days of fireline rehabilitation

Manual fuel reduction:

- Remove ladder fuels and redistribute concentrations of fuel.
 - o Each event may include the relocation, scattering, or piling of fire fuels, limbing trees, cutting vegetation
 - o May be conducted separately or in conjunction with pile burning and/or prescribed fire
- Affected area up to 25 acres/year.
- Typical duration of 5-7 days per occurrence

Pile Burning:

- Average of 1 time/year.
- Typical duration
 - o Ignition 2-5 days per occurrence
 - o Burndown 2-5 days per occurrence
 - o Monitoring and patrol 1-3 weeks per occurrence
 - o Includes hand ignition (drip torch) and monitoring

- Typically, up to 100 piles occurrence
 - o Each circular pile measures approximately 10' diameter x 6' high
 - o Typically conducted on snow and in varying locations from year to year to minimize impacts to underlying soils

Prescribed Fire (broadcast):

- Up to 3 projects per year
 - o Each project may include: fireline construction, tree limbing, snag cutting, placement of pumps, portable water reservoirs and hoses, sprinklers, hand ignition (drip torch), monitoring, area closures
- Average preparation duration – 5 days
- Average burn execution
 - o Ignition – 1-2 days
 - o Burndown – 1-5 days
 - o Monitoring – 1-4 weeks

Fire Effects Monitoring:

- Up to 50 permanent new plot markers (rebar stakes)
- Plots checked by staff every 5-10 years

4(c) Prohibited uses:

- Chainsaws
- Portable pumps
- Other miscellaneous hand-held power tools (e.g., leaf blower, weed whacker)
- Low level aircraft overflights and delivery of aerial water drops and retardant, aerial delivery of sling loads
- Installation of permanent plot markers

Mitigations:

- Utilize Minimum Impact Strategies and Tactics (MIST) for all operations
 - o See *NPS-18 - Chapter 2, Exhibit 2* for MIST standards
- Fireline rehabilitation
- For fuels projects, implement work outside of high visitor season when possible (includes both unit preparation and implementation for prescribed and pile burns)
- Use crews with primitive tool skills (when available) for manual fuel reduction and prescribed fire preparation
- Install plot markers away from trails and public areas

A. Wilderness Character:

Does this alternative affect the qualities of wilderness character? *For definitions of wilderness character qualities, see the MRA Instructions.*

Untrammelled:

Yes: ☒ **No:** ☐

Explain:

All fire operations create short term trammeling and manipulate natural processes. The addition of active fuels management within the wilderness will create new, short term trammeling. However, those actions will allow a long-term decrease in aggressive management of naturally caused wildfires, reducing future trammeling and restoring and perpetuating fire as a natural process. The actions will also reduce the risk of future uncharacteristic high severity fire effects on the natural character of the wilderness.

Undeveloped: Yes: ☒ No: ☐

Explain:

Short-term negative impacts from motorized equipment (saws, pumps, leaf blower, weed whacker) for fire suppression, wildfire beneficial use, manual fuel reduction, and prescribed fire.

Up to 50 additional permanent fire effects plot markers would be installed to track the outcomes of the fuel treatments per NPS fire management guidance. The plot markers would consist of unpainted rebar stakes driven into the ground and protruding approximately 12 inches above ground. Plots would be located away from trails and other public areas. The new plots would be an addition to the existing fire effects plot network which consists of five - Fire Monitoring Handbook (FMH) standard plots and 20 tree regeneration plots. The existing plot markers consist of 125 pieces of rebar and approximately 200 tree tags in wilderness.

Natural: Yes: ☒ No: ☐

Explain:

Short and long term beneficial effects from restoring and maintaining natural vegetation structure and ecosystem function.

Opportunities for Solitude or Primitive and Unconfined Recreation:

Yes: ☒ No: ☐

Explain:

Infrequent short-term negative impacts to solitude from suppression and fuels treatment activities (sights and sounds of equipment, aircraft, etc.) and area closures which would limit access to wilderness.

Other Features of Value (e.g. Cultural Resources, Science):

Yes: ☒ No: ☐

Explain:

Benefits this quality by reducing risk of impacts from suppression activities or extreme fire behavior due to ability to target these resources with treatments that would allow them to survive a fire event.

B. Safety:

How does this alternative affect visitor and/or employee safety? Does it present a new or changed situation that threatens visitor safety? If there are adverse effects, what mitigation measures will be taken? Which hazards cannot be mitigated?

Visitor Safety:

Reduce the risk to park visitors and adjacent communities from uncontrollable fire events.

Employee Safety:

Increased operations (e.g., fuels) may slightly increase firefighter exposure to hazardous work environments in the short-term but would reduce future fire severity and firefighter risk in the long-term.

C. Other Criteria

Does this alternative help maintain proficiency in the use of primitive and traditional skills? Does it affect the special provisions (grazing, mining, water developments, access to non-federal land, etc.) identified in Sections 4 and 5 of the Wilderness Act? Are there any timing requirements or cost constraints that need to be considered?

Yes: ☒ No: ☐

Explain:

When trained crews are available, this alternative will promote and maintain proficiency in use of primitive tools.

Summary of fire management program elements within wilderness, by alternative.

Program Elements	Alternative A - No Action – Continue 2005 FMP	Alternative B – Preferred Alternative
Wildfire Suppression	X	X
Wildfire Beneficial Use		X
Prescribed Fire		X
Manual Fuel Reduction		X
Pile Burning		X
Fire Effects Monitoring	X	X

Comparison of Alternatives						
Rate each alternative on a scale of +3 to -3.						
-3 High Negative Impact	-2 Moderate Negative Impact	-1 Low Negative Impact	0 No Impact/ Undeterminable	+1 Low Positive Impact	+2 Moderate Positive Impact	+3 High Positive Impact

Wilderness Character	Alternative 1 – No Action		Alternative 2 – Preferred Action	
	Short Term	Long Term	Short Term	Long Term
Untrammelled	-2	-2	-3	-1
Undeveloped	-1	-1	-1	-1
Natural	-1	-3	-1	+3
Solitude or Primitive and Unconfined Recreation	-1	-1	-1	-1
Unique / Other Features	-1	-2	+2	+2
Total	-6	-9	-4	2

Safety	Alternative 1 – No Action		Alternative 2 – Preferred Action	
	Short Term	Long Term	Short Term	Long Term
Visitor	-1	-1	-1	+1
Employee	-1	-2	-2	+1
Total	-2	-3	-3	+2

Other Criteria Summary	Short-term	Long-term	Short-term	Long-term
	Alternative 1 No Action	Alternative 1 No Action	Alternative 2	Alternative 2

Total

Decision:
What is the minimum activity?

Select an alternative. Usually, the alternative that has the least overall adverse effect on wilderness character is preferred. However, there may be other considerations.

Note: When selecting the preferred alternative the potential disruption to wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience. If a compromise of wilderness character or resources is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term acceptable adverse impacts will be allowed.

Selected alternative: Alternative 2

Rationale (include safety criterion, if appropriate):

Alternative 2 produces more net long-term benefits to key wilderness character qualities, with special emphasis on restoring and maintaining natural conditions and reducing the future risk of unnatural fire severity and vegetation change. Alternative 2 does produce some minor short-term negative effects which can be partially mitigated by careful project timing and the use of MIST strategies for all activities. The list of MIST requirements to be implemented during all fire operations are attached.

Cumulative Effects:

Do you know of any other projects in the vicinity of your project location(s) (past, present, or future) that have the potential to impact wilderness character?

Yes: ☐ No: ☒

If yes, please describe.

Provide details on Wilderness Act Section 4(c) uses proposed in this alternative:

4(c) Prohibition	Frequency and/or Quantity	Duration
mechanical transport	None	
motorized equipment	10-20 days per year	Up to 8 hours/day
motor vehicles	None	
motorboats	None	
landing of aircraft	None	Rare emergency
structure(s)/installation(s)	Up to 50 permanent fire effects plot markers	
	None	

Additional mitigation, monitoring and reporting requirements (Reviewers provide input):

Follow-Up Form Required: **Yes:** ☐ **No:** ☒

STEP 4: Signatures and Reporting
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Prepared by:

Name	Position	Date
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Review and Comments		
Name/Position	Comments	Date
Erik Frenzel Wilderness Coordinator	Only minor edits to wilderness character impacts needed.	4/23/2018
Environmental Protection Specialist	I had some comments and questions. Call me if you need clarification.	4/27/2018
Other reviewer as appropriate		

Approvals	Print Name	Signature	Date
Recommended	Division Chief		
Approved:	Superintendent		

Return to Office of Compliance and Planning for decision file once document has been approved by the Superintendent.

Devils Postpile National Monument

Minimum Impact Suppression Techniques (MIST) and Management Requirements

Applicable to all Operations

- No fire vehicles off approved roads.
- Each request for the use of mechanized vehicles off roads requires Superintendent approval.
- Use natural and man-made barriers for holding whenever possible.
- No ground disturbance beyond minimal firelines without express permission of park Superintendent and consultation with park resource staff.
- When fireline construction is necessary, keep line width as narrow as possible.
- On-the-ground suppression actions or fireline construction for prescribed burning involving ground disturbance or tree felling in wetlands or riparian corridors will require prior approval of the monument's Superintendent or designee.
- Protect historic structures, sensitive cultural sites, the Rainbow Falls viewshed, and the Postpile formation from fire by improving defensible space around them.
- Use sprinkler systems for protection of sensitive resources where possible.
- Use low pressure water application (sprinklers, backpack pumps, etc.) to minimize hydraulic excavation and erosion.
- Use mop-up activities that minimize ground disturbance.
- Efforts should be made to protect all cultural resources and if discovered, resource advisor should be notified.
- Firefighter safety is a priority but when possible, avoid cutting snags over 30" diameter to retain for wildlife habitat.
- Water may be drawn from the river but intake hoses and portable pumps must be placed to minimize riverbank damage, sit on an absorbent pad to prevent fuel leaking, and have a spill kit on site.
- Backfill cup trenches and scarify wide firelines.
- Scatter cut debris into a natural or random arrangement.
- Position cut ends of logs to be inconspicuous to visitors and camouflage where possible.
- Flush cut stumps.

Wildfire Management

- In addition to MIST/Mitigation requirements for all operations:
 - On-the-ground wildfire management actions undertaken in the meadows or near the river will require prior approval of the monument's resource advisor.
 - Avoid use of all fire retardant chemicals within 300' of rivers, streams, and wetlands.
 - No chemical (non-water) retardant should be used directly on the Postpile formation or cliffs surrounding Rainbow Falls.
 - No fire chemicals including retardant, foam, or surfactants shall be used in the monument without prior approval from the Superintendent or designee.
 - Use of helicopters for water drops and sling loads of equipment is approved.
 - Minimize low-level aircraft overflights.
 - Except in life/safety emergency, Superintendent approval is required for landings.
 - All flagging and other temporary evidence will be removed prior to release of fire resources.
 - All equipment and debris will be removed from the area for proper disposal.

- Before Incident Managers and fire resources leave, fireline rehabilitation will be completed to mitigate impacts of the fire management actions.
- Develop a rehabilitation plan for all impacts when necessary.
 - If needed, develop a Burned Area Emergency Rehabilitation (BAER) and/or Burned Area Rehabilitation (BAR) request.

Fuels Projects

- In addition to MIST/Mitigation requirements for all operations:
- All equipment used for prescribed burning activities will be washed and inspected prior to use to reduce potential for the spread of invasive species.
- Project work, including burn operations, should be conducted during the shoulder season whenever possible to minimize disturbance to wilderness character and visitor use.
- When available, crews trained in the use of primitive tools should be used for work within the wilderness.

Fire Effects Monitoring

- Plot markers will be installed away from trails and areas of visitor use

APPENDIX H: RELATED GUIDANCE DOCUMENTS AND PLANS

In addition to the federal wildland fire management policy documents that apply to the primary federal land management agencies, FMPs integrate and seek to implement guidance provided in monument-specific documents.

Devils Postpile Foundation Document 2017

NPS foundational documents provide basic guidance for planning and management within park units. The monument's Foundation Document identifies a revision/update to the monument's FMP as a high-priority planning need. The foundation document identified the following guidelines for the FMP revision:

- To minimize wildfire danger and forest community type conversion;
- To evaluate the effects of fire and fuels management activities on natural and cultural resources;
- To continue to reintroduce fire onto the landscape;
- To refine the fire management activities and objectives;
- To collaborate with INF staff to develop and implement valley-wide fuels and fire management strategies; and
- To provide clarity in the Fire Protection Unit response to natural and human-caused wildfires in the monument.

Devils Postpile National Monument Resource Stewardship Strategy 2017

The Resource Stewardship Strategy (RSS) is an adaptive framework for identification and protection of highly valued resources within the monument over the next decade. The RSS acknowledges that the monument is a functional part of several converging biogeographic regions affected by dynamic physical processes, such as fire and hydrology, that influence a diverse and evolving biota (NPS 2017b, pg. 5). One of the fundamental resources and values for the monument includes being a component of a larger ecosystem. The RSS identifies management objectives for this fundamental resource and value. The management objectives related to fire management activities include:

- Develop an improved understanding of the range of variability of past fire regimes as well as current effects of altered fire regimes in the watershed;
- Implement forest and fuel management to minimize changes for stand-replacing fires within the monument;
- Implement actions that promote ecosystem and landscape resilience and resistance within and beyond park boundaries throughout the region; and
- Improve understanding of air quality conditions and trends, and develop activities and targets for best management practices to promote good conditions for air quality in the monument and watershed

Devils Postpile National Monument State of the Park Report 2016

The State of Park report assesses the overall condition of the monument's priority resources and values, communicates complex resource condition information to visitors and the public, and informs visitors and stakeholders about the stewardship actions being taken by NPS staff to maintain or improve the condition of the priority resources for future generations. The report is a comprehensive snapshot of the status and trends of the monument's resources and values. It highlights ongoing stewardship activities and accomplishments

undertaken to maintain or improve the state of the monument and identifies key issues and challenges facing the monument. The following resource conditions and key issues are related to the monument's revised FMP:

- **Air quality** – The monument can sometimes experience high levels of photochemical smog more typical of urban areas. Ongoing research indicates that polluted air is transported up the river canyon from more populated regions of California such as the Central Valley and Bay area. Although the monument is limited in ways to improve local air quality, supporting research and providing real-time information on air quality conditions provides baseline information and indications of changing conditions while also allowing managers to inform visitors so that they can plan their visit accordingly.
- **Conifer forests, landscape, and ecosystem processes** – The past century of fire exclusion has greatly altered the fire regime within the monument and the surrounding landscape, resulting in high-severity fires due to high fuel loads. Large disturbance events such as the 1992 Rainbow Fire and the 2011 Devils Windstorm blowdown impacted forests dramatically and will influence stand structure and species composition for decades. These past events, combined with drought, a higher proportion of rain versus snow, and a warming climate, are likely to have profound effects on conifer forests, plant communities, and associated wildlife and are of significant concern. For example, the combination of a warming climate and high fuel loads increases the risk of catastrophic fires and subsequent adverse impacts on ecosystems and public safety. The monument is responding to this heightened risk with a robust hazard fuel reduction effort, and coordination with the neighboring INF to implement both pile and broadcast burning in the non-wilderness portion of the monument. Reintroduction of fire and fuel reduction projects in the wilderness areas of the monument is limited and will require continued coordination with the INF.
- **Wilderness character** – Due to its relative isolation and position within a largely intact landscape managed as wilderness, natural resources within the monument are relatively unaffected. The most profound impact on the natural quality of wilderness is fire exclusion and the resulting altered fire regime. The Rainbow Fire resulted in unprecedented high severity due to unnatural accumulation of fuels and high density of trees after nearly 100 years of fire exclusion. Additionally, fire suppression does occur and degrades the untrammeled quality of wilderness.

Devils Postpile National Monument General Management Plan 2015

The GMP articulates a vision and overall management framework for the monument that will guide decision-making for the foreseeable future. The GMP includes management strategies for resource protection and preservation, visitor use, interpretation and education, use of facilities, the need for new facilities, and the long-term operation and management of the monument. The GMP directs the NPS to implement the FMP, updating it when necessary, consistent with federal law and departmental management policies. The GMP also directs that all fire management activities in wilderness must conform to the basic purposes of wilderness (NPS 2014). The GMP acknowledges the support and partnership provided by the INF fire and fuels management crews in providing fire and emergency response and in coordination, planning, and implementation of fuels management projects in the monument.